

# A PROPOSAL TO STRENGTHEN TVET & SKILLS DATA IN BANGLADESH

Prepared by  
The National Institute of Labour Studies  
Flinders University, Adelaide, Australia.

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# Abbreviations

|         |                                                                    |
|---------|--------------------------------------------------------------------|
| BAIRA   | Bangladesh Association of International Recruiting Agencies        |
| BANBEIS | Bangladesh Bureau of Educational Information and Statistics        |
| BBS     | Bangladesh Bureau of Statistics                                    |
| BEI     | Bangladesh Enterprise Institute                                    |
| BGMEA   | Bangladesh Garments Manufacturers & Exporters Association          |
| BIDS    | Bangladesh Institute of Development Studies                        |
| BITAC   | Bangladesh Industrial and Technical Assistance Center              |
| BKMEA   | Bangladesh Knitwear Manufacturers & Exporters Association          |
| BMET    | Bureau of Manpower Employment and Training                         |
| BOESL   | Bangladesh Overseas Employment Services Limited                    |
| BOI     | Board of Investment                                                |
| BRAC    | Bangladesh Rural Advancement Committee                             |
| BSCO    | Bangladesh Standard Classification of Occupation                   |
| BSIC    | Bangladesh Standard Industrial Classification                      |
| BTEB    | Bangladesh Technical Education Board                               |
| CBT     | Community Based Training                                           |
| CMI     | Census on Manufacturing Industries                                 |
| CNC     | Computer and Numerical Controlled                                  |
| DAE     | Department of Agricultural Extension                               |
| DTE     | Directorate of Technical Education                                 |
| DYD     | Department of Youth Development                                    |
| EPZ     | Export Processing Zone                                             |
| EU      | European Union                                                     |
| FDI     | Foreign Direct Investment                                          |
| GDP     | Gross Domestic Product                                             |
| GOB     | Government of Bangladesh                                           |
| HRD     | Human Resource Development                                         |
| ICT     | Information and Communication Technology                           |
| ILO     | International Labour Organization                                  |
| ISCO    | International Standard Classification of Occupation                |
| IT      | Information Technology                                             |
| LFS     | Labour Force Survey                                                |
| MoA     | Ministry of Agriculture                                            |
| MoC     | Ministry of Communication                                          |
| MoCAT   | Ministry of Civil Aviation & Tourism                               |
| MoE     | Ministry of Education                                              |
| MoEF    | Ministry of Environment and Forest                                 |
| MoEWOE  | Ministry of Expatriates' Welfare and Overseas Employment           |
| MoFL    | Ministry of Fisheries & Livestock                                  |
| MoHFW   | Ministry of Health and Family Welfare                              |
| MoI     | Ministry of Industries                                             |
| MoJT    | Ministry of Jute and Textiles                                      |
| MoLE    | Ministry of Labour and Employment                                  |
| MoLGRDC | Ministry of Local Government, Rural Development & Cooperatives     |
| MoPERM  | Ministry of Power, Energy & Mineral Resources                      |
| MoPT    | Ministry of Posts & Telecommunication                              |
| MoS     | Ministry of Shipping                                               |
| MoSICT  | Ministry of Science and Information & Communication and Technology |
| MoSW    | Ministry of Social Welfare                                         |
| MoWCA   | Ministry of Women and Children Affairs                             |
| MoYS    | Ministry of Youth & Sports                                         |
| NGO     | Non- Government Organization                                       |

|       |                                                           |
|-------|-----------------------------------------------------------|
| NSS   | National Skill Standard                                   |
| NDC   | NSDC Data Cell                                            |
| NTVQF | National Technical and Vocational Qualification Framework |
| OCR   | Optical character recognition                             |
| OJT   | On the Job Training                                       |
| RMG   | Readymade Garments                                        |
| TICI  | Training Institute for Chemical Industries                |
| TSC   | Technical School and College                              |
| TTC   | Technical Training Center                                 |
| TTI   | Technical Training Institute                              |
| TVET  | Technical and Vocational Education and Training           |
| TVQF  | Technical & Vocational Qualifications Framework           |
| UCEP  | Underprivileged Children Education Program                |
| VTI   | Vocational Training Institute                             |
| WTC   | Women Training Center                                     |

# Executive summary

This report was commissioned by the ILO as part of its Technical and Vocational Education and Training (TVET) Reform Project in Bangladesh, which is funded by the European Commission and being implemented by the ILO. The central objective of the report is to present a proposal for a TVET data system in Bangladesh which will strengthen monitoring of TVET delivery so that the supply and demand for skills can be more closely aligned and to inform future policy, management and investment decisions in TVET.

This report defines datasets and associated collection methods required to facilitate improved functioning of the TVET system, giving regard to pragmatic considerations, such as the availability of data in Bangladesh and the costs associated with assembling and processing new data sets.

It is important to recognise that understanding the characteristics and dynamics of labour forces and education systems in each country is a long-term proposition that requires the accumulation of significant time series of data and associated ongoing assessment and research effort. We therefore emphasise the importance of systematically building knowledge about the Bangladesh TVET system and therefore the need for the supporting data systems to be efficient and sustainable in the long run.

## Recommendations

### **Institutional arrangements**

1. An NSDC Data Cell (NDC) be set up to undertake primary roles in the collection, management, analysis and publication of data for the TVET data system (see Section 3.5.12.1).
2. Skills Councils (ISCs) be set up in priority industries to work with the NDC and to gather quantitative and qualitative data about employment and skill use/needs in their industries (see Section 3.5.12.2).
3. We recommend that NDC and ISCs, at least initially, consider outsourcing IT and survey tasks to organisations such as BSS, BANBEIS and BTEB.

### **Data standards**

4. We recommend that new data collections including occupational data for the TVET data system adopt a new Bangladesh Standard Occupational Classification based on the most recent International Standard Occupational Classification.
5. We recommend that new data collections including qualifications data for the TVET data system adopt the ILO-recommended National Technical and Vocational Qualifications Framework (NTVQF).

## **Data collections**

6. We recommend that new datasets for TVET providers, students, curriculum, subject, enrolment and qualification completed be adopted by all stakeholders (see Section 3).
7. We recommend that the initial coverage for this core TVET data be providers and students associated with BTEB-affiliated courses and all courses provided by public agencies (see Section 3.3.2).
8. We recommend that NDC be empowered to require public agencies that provide TVET courses to provide data in specified formats.
9. We recommend that private providers of non-BTEB affiliated courses be encouraged with a range of incentives to provide data as specified in Recommendation 8 above.
10. We recommend that the more detailed data be collected in a regular (every 2 to 5 years depending on availability of resources) survey of Enterprises and Employers on qualification and occupation distributions. To be collected by NDC initially in priority industries but eventually in all significant industries (see Section 3.5.5).
11. We recommend that ISCs be responsible for the collection of industry qualification and occupation data under the supervision of the NDC. Some of the survey activity may be outsourced to BBS. BBS should consider including developing more detailed industry/occupation/qualification datasets and are should cooperate with NDC to achieve efficiencies in surveying. Opportunities for co-funding improved data set should be explored.
12. We recommend that BMET be resourced and tasked with collecting more detailed skills and qualifications data according to NTVQF for Bangladeshi workers as they leave and as they re-enter Bangladesh (see Section 0).
13. We recommend that BMET be resourced and tasked with producing regular forecasts of overseas demand for Bangladeshi workers classified to BSCO occupations and NTVQF qualifications (see Section 3.5.6).
14. We recommend that a regular survey of student outcomes be conducted by the NSDC (see Section 3.6.1).
15. We recommended that BBS be resourced and tasked with developing a set of job vacancy indexes based on regular surveys (see Section 0).

# 1 An international survey of TVET data systems and issues

In this section we review available literature on the TVET data systems operating in selected other countries. This is not a comprehensive literature review - it is an instrumental search for examples of how other countries assemble and use data to inform their TVET sectors.

Specifically, we provide examples of (i) how supply-side (of training places by providers and of skilled labour) and demand-side (for training places by prospective students and for skilled labour by industry/employers) data are collected (ii) how various TVET stakeholders (policy makers, TVET administrators/planners, training providers, industry/employers, and students) use the collected data. We use the insights from this review to guide our recommendations for Bangladesh.

We begin with a detailed review of the Australian VET data system since comprehensive and concise information about the system is publically available. Further, it is regarded as a very well developed VET system which enjoys a high degree of confidence, based in part on strong engagement with employers and good data and research systems (OECD, 2008a).

Secondly, we look briefly at a selection of European Union (EU) member states and the USA in our search for additional examples/ideas. Our discussion will not encompass a detailed description and or critical review of individual country TVET data systems. Rather, examples will be garnered from the literature and where these themes are considered informative in relation to the development of a TVET data system in Bangladesh, they will be discussed at a high level.

Thirdly, we will review the TVET data systems of Sri Lanka and India – countries which to varying degrees are considered comparable to Bangladesh in terms of the evolution of their training systems, labour markets and their economies.

Finally we list the key points from this review and which we apply to the development of a TVET data system in Bangladesh.

## 1.1 Australia

### 1.1.1 VET data system

#### 1.1.1.1 Key statistical organisations: NCVER and the ABS

The National Centre for Vocational Education Research (NCVER) and the Australian Bureau of Statistics (ABS) are the key organisations responsible for the collection and management of VET data in Australia.

NCVER is an independent company which is owned by government ministers responsible for vocational education and training at the state and federal level<sup>1</sup>. NCVER's main activities are: (i) collecting VET statistics; (ii) managing national VET research grants; (iii) managing a VET research database; and (iv) conducting and disseminating the results of research and data analysis. These activities are financed mainly (85%) by the Commonwealth Department of Education, Employment and Workplace Relations (DEEWR), which is the lead government agency providing national leadership in education and workplace training (OECD, 2008a).

The ABS is Australia's official statistical organisation and is responsible for the collection of population census data as well as education-related and labour force survey data.

#### **1.1.1.2 National VET Statistical Collections and Surveys**

The National VET Collections, for which NCVER is responsible, are:

- national collection of VET provider data – student characteristics, courses and qualifications, completions, hours of delivery, funding source, etc
- national VET in Schools data collection
- national collection of VET financial data – comprising income statements, balance sheets, statements of cash flows, operating expenses by activity, equity statements from individual providers
- enumeration of offshore VET delivery by public providers
- national collection of apprenticeship and traineeship data

NCVER manages a number of sample-based surveys, including: the Student Outcomes Survey and the Survey of Employers' Use and Views of the VET System. It also manages the Longitudinal Survey of Australian Youth (LSAY) which tracks students as they move from school into further study, work and other destinations. In addition, NCVER manages one-off targeted surveys, including: Apprentice and Trainee Destination Survey; Down the Track Survey; and, Indigenous Student Survey.

In addition to a regular census of the Australian population, the ABS conducts sample-based surveys relevant to the VET system. This includes; a regular Labour Force Survey, Survey of Education and Work, the Survey of Education and Training, the Adult Literacy and Lifeskills Survey, and the Training Expenditure and Practices Survey.

These collections and surveys are outlined in the table overleaf.

---

<sup>1</sup> The Commonwealth of Australia comprises six states and two territories. The Australian Government, known also as the Federal Government, passes laws which affect the whole country. Although the six states joined together form the Federal Government, they still each retain the power to make their own laws over matters not controlled by the Commonwealth.

**Table 1: Outline of collections and surveys comprising current national VET statistics**

| Collections, survey                                                                                                    | What is it?                                                                                                                                                                                                                                                                                              | Frequency                                                                                                                                               | Major purposes                                                                                                                                                                                                    |
|------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| National VET Provider Collection (NCVER)                                                                               | Administrative collection of information on students, the courses they undertake and their achievement. The information is sourced from student enrolment records and through state training authorities from registered training providers.                                                             | Annual national collection                                                                                                                              | Provide information about the takeup of public VET programs, characteristics of learners, and the outputs. Also provides the source for key performance measure reporting and the Student Outcomes Survey sample. |
| MCEETYA VET in Schools Collection (NCVER)                                                                              | Administrative collection of courses undertaken by school students in recognised VET qualifications, including Certificate I, II, and III, including senior secondary certificate and achievement. Sourced from student enrolment records through the board of studies in each state or territory.       | Annual national collection. Scope is school students undertaking courses in recognised VET qualifications as part of their senior secondary achievement | As above for those school students who undertake recognised VET as part of a senior secondary certificate (usually in year 11 or 12 of schooling).                                                                |
| National VET Financial Data Collection (NCVER)                                                                         | Administrative collection of information on the finances of state training authorities.                                                                                                                                                                                                                  | Annual national collection. Scope is the revenue and expenditure of the eight state and territory governments and the Australian government.            | Identify major sources of funding in the public VET system, accountability under contractual agreements, reporting of key performance measures.                                                                   |
| National Apprentice and Trainee Collection (NCVER)                                                                     | Administrative collection on apprentices and trainees and their employers. Sourced from state training authorities via Australian Apprenticeships Centres from the Apprenticeship/Traineeship Training Contracts registered at the time of commencement and updated throughout the life of the contract. | Quarterly national collection. Scope is all apprentices and trainees with an Apprenticeship/Traineeship Training Contract.                              | Monitor trends in apprenticeship and traineeship activity, including outputs. Data are also used for follow-up surveys of former apprentices and trainees.                                                        |
| Delivery of VET Offshore by Public Providers published by Australian Education International (AEI) collected by NCVER. | An administrative collection devoted to the offshore activities of public providers of vocational education and training (VET).                                                                                                                                                                          | Annual. Scope is public providers of vocational education and training (TAFE and higher education institutes delivering VET).                           | Monitor amount and type of Australian VET being delivered overseas (education and training is a major export industry for Australia).                                                                             |
| Apprentice and Trainee Destination Survey (NCVER)                                                                      | A telephone survey of the employment and further study outcomes of apprentices and trainees, their satisfaction with the apprenticeship or traineeship, and reasons for non-completion (where applicable).                                                                                               | Was conducted in 2008. Scope all apprentices and trainees, aged 15 years and over, who left their training between October and December 2007.           | Obtain information about the medium-term workforce outcomes of former apprentices and trainees. Allows the contribution that this mode of training makes to meeting national skill needs.                         |

|                                                                             |                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                 |
|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Student Outcomes Survey previously TAFE Graduate Destination Survey (NCVER) | A self-identification survey of students who completed or part-completed a qualification in the preceding year, covering their views on the training they received and their current activity.                    | Annual, dates back to 1997 and renamed the Student Outcomes Survey in 1999. Varies in scale from large (institutional level) to medium sample (state level) in alternate years. Has had frequent scope changes. Currently covers students who complete or part-complete a qualification. | Wide-ranging information on various aspects of satisfaction, outcomes about 6 months after training, reasons for undertaking training etc. Provides institute-level information every 2nd year. |
| Survey of Employer Use and Views of the VET System (NCVER)                  | A telephone survey of employers covering their satisfaction with aspects of the VET system, including satisfaction with the skills of recent VET graduates.                                                       | Irregular. Last conducted in 2007, previously in 2001 and 2005 and before then on a biennial basis back to 1995. Have had frequent changes in scope. Current scope is all employers. <sup>2</sup>                                                                                        | Provides information on how employers regard and use the VET system, how they meet their skill needs etc.                                                                                       |
| Indigenous Student Survey (NCVER)                                           | A face-to-face survey of Indigenous students that extends some of the information sought in the Student Outcomes Survey (SOS), with a specific focus on Indigenous people and the benefits arising from training. | Irregular. Was conducted in 2004. Scope was Indigenous students in the public VET system who undertook any training in 2003.                                                                                                                                                             | Aims to provide more detailed information than is possible with the SOS and other surveys for indigenous Australians, who are a major focus of access and equity programs in Australia.         |
| Down the Track (NCVER)                                                      | A national telephone survey following up students who completed or part completed a qualification in 2001, looking at their longer term outcomes and benefits from training                                       | One-off targeted survey conducted in 2004 of 15-24 year old graduates and module completers who responded to the 2002 Student Outcomes Survey.                                                                                                                                           | Similar to the SOS but with a longer-term perspective.                                                                                                                                          |
| Survey of Education and Work (ABS)                                          | A household survey with the focus on educational attainment, participation and transitions. A supplement to the Labour Force Survey.                                                                              | Annual, dates back to 1964. Has had frequent change in scope. Current scope is civilian population aged 15 years and over                                                                                                                                                                |                                                                                                                                                                                                 |
| Survey of Education and Training (ABS)                                      | A household survey with extensive information obtained on educational qualifications and participation in education and completed training courses in current and previous year prior to the survey.              | Quadrennial. Dates back to 1989 and was last conducted in 2005. Scope has widened to population aged 15 years and over.                                                                                                                                                                  |                                                                                                                                                                                                 |
| Adult Literacy and Lifeskills Survey (ABS)                                  | Household survey on aspects of literacy and numeracy, matched with objective assessments of same, allowing international comparisons.                                                                             | Irregular. Last conducted in 1996 and 2006. Scope is population aged 15 to 74 years.                                                                                                                                                                                                     | Monitor literacy and numeracy levels in the Australian population, provide information to support policy development in this area etc.                                                          |
| Training Expenditure and Practices Survey (ABS)                             | A business survey, covering training expenditure and training practices.                                                                                                                                          | Irregular                                                                                                                                                                                                                                                                                | Evaluate and monitor employer spending on training and how this is organised.                                                                                                                   |

Source: NCVER, Australian vocational education and training statistics explained.. May 2009, Table 1, pp.6-7.

<sup>2</sup> The Australian Business Register (ABR) was used as the sampling frame for this survey. The ABR is the most complete and up-to-date frame of Australian employers available. In the latest (2007) survey, a total of 30 000 records were randomly selected from the ABR, resulting in 4701 interviews.

The national VET collections offer a good statistical information base. However, there are flaws and limitations, for example, the difficulties arising in determining what constitutes VET and confining the provider collections to VET funded by the government. For reasons of pragmatism VET has included everything in the Australian Quality Training Framework (AQTF), that is, recognised training. Determining whether non-AQTF activity is VET is, however, more problematic. Providers in both the public and private sectors deliver programs in areas such as religious, cultural and foreign language studies, and determining the status of these for collection purposes can be difficult. In practice, the intention of the designers of the learning program is used. If the intention is to develop vocational skills, then the program is VET, otherwise it is not. Another serious limitation is scope. Currently, the scope for the provider and financial collections is VET funded by state training authorities. However, a considerable amount of recognised VET is funded from other sources, both public and private, and delivered by non-TAFE (Technical and Further Education) providers (Knight and Cully, 2007).

#### 1.1.1.3

##### **Standards for the management of statistical information: AVETMISS**

Australia has in place a nationally agreed framework or set of rules that facilitates the collection of consistent and accurate data on the vocational education and training sector throughout Australia. This framework is known as the Australian Vocational Education and Training Management Information Statistical Standard (AVETMISS). The AVETMISS specifies what information will be collected, the timing frequency of collection, classifications to be applied to describe the information that is collected and data formats.

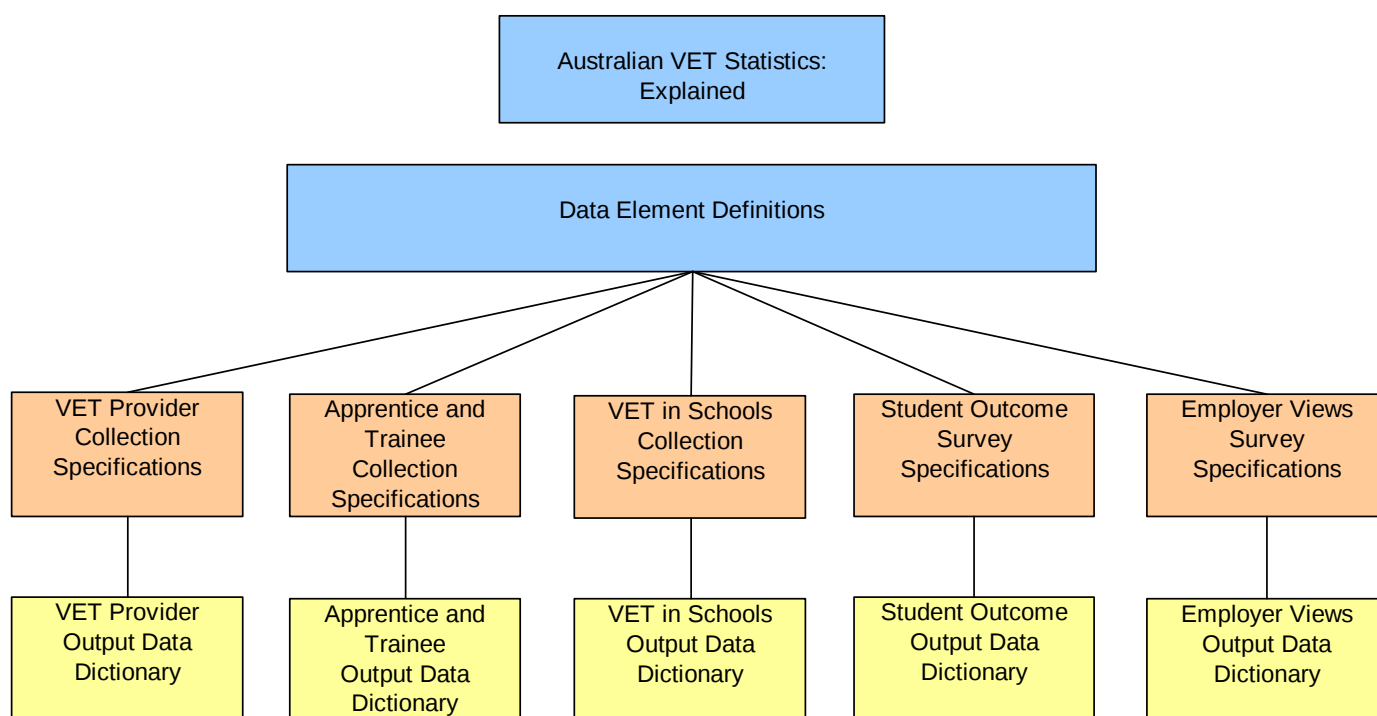
Standards such as the Australian Vocational Education and Training Management Information Statistical Standard have an important practical function. The process of developing statistical standards forces stakeholders to identify and prioritise their information requirements and, because reliable information is never free, allows the cost and benefits to be assessed. The process of developing and maintaining collection arrangements and standards also promotes buy-in and ownership among stakeholders, an important and often under-appreciated aspect—without it, data collections rarely run smoothly and may even provoke considerable hostility if they are imposed without proper consultation and cooperative development (Knight and Cully, 2007, p. 28)

The AVETMISS definitions consist of a suite of documents (illustrated in Figure 1):

- Australian VET Statistics: Explained – provides a synopsis of the VET system, collections, surveys, information systems and subsequent statistical reports. A summary of the AVETMISS Standards and references to other AVETMISS documents are included.
- Data Element Definitions – provides listings of the data elements' definitions, context, rules for use, the code set and format attributes for all collections and surveys.
- Collection Specifications – provides listings of the data elements collected in each file, defines the position, length, and data type of data elements for each record, and provides rules for the accurate submission of data for a specific collection.

- Output Data Dictionary – provides definitions of all data used in statistical reporting.

Figure 1: Representation of the AVETMIS Standard suite of documents



Source: NCVER, AVETMISS Data Element Definitions: Edition 2, March 2008

#### 1.1.1.4 Dissemination and Presentation of VET statistics

Since the purpose of data is to inform decision making, data and research must be disseminated in a way which meets the needs of users in terms of accessibility and meaningfulness. There are currently a number of mechanisms in Australia for disseminating VET statistics.

NCVER maintains a searchable catalogue which can be accessed via its website - [www.ncver.edu.au](http://www.ncver.edu.au). The catalogue contains information published by NCVER, including: statistical reports; research reports, selected conference papers; statistical standards; and technical papers and so on. Access to much of this online information is free. Information is available in a variety of formats, including PDF, Word, Excel and hard copy.

NCVER also publishes an easy to read statistical report called a 'Pocket Book'. Presented in pocket guide format, this publication contains data from the latest VET collections. It includes key data on students and courses, apprentices and trainees, training activity, graduates, VET in Schools, the financial operations of the VET system and employers' use and views of the VET system. The pocket books can be downloaded from the NCVER website.

The ABS website – [www.abs.gov.au](http://www.abs.gov.au) - provides access to a wide range of statistical information (including time series information) about education and training some of

which is freely available while more detailed information is available for purchase online. Information is available in a variety of formats, including PDF, Word, Excel, SuperTABLE, and hard copy.

Researchers and analysts wishing to run their own statistical queries may purchase microdata in the form of confidentialised unit record files (CURFs) from NCVER and the ABS. CURFs are files of responses to ABS/NCVER surveys that have had specific identifying information about persons and organisations confidentialised.

#### **1.1.1.5 Sector level intelligence**

In Australia, Industry Skills Councils, (ISCs) and Industry Skills Boards (ISBs) play an important role in gathering intelligence, in the form of both qualitative and quantitative data, in specific industries. ISCs are privately registered companies run by industry-based boards of directors, but whose funding is provided substantially by the federal government. They develop 'Industry Skills Reports' which analyse national VET trends, discuss the drivers of industry skill needs and offer a range of strategies to address future skills and workforce development requirements. The reports draw on a variety of information, including intelligence obtained via consultations and workshops with employers and industry representatives and data from a range of sources, particularly the ABS and NCVER. In South Australia, Industry Skills Boards (ISBs) play a similar role as the ISCs at the national level. Coordination and communication between the two, however, is currently limited.

## **1.2 Users of VET data in Australia**

It is important to understand that in most TVET systems data is collected for the purpose of facilitating evidence-based decision making and decisions are made by stakeholders at every level of the TVET system. In Australia the following stakeholders make the following decisions:

- Policy makers/Planners/Administrators - will Australia have an adequate supply of skilled labour (in terms of quantity and type) to meet demand in the future? What type of training and how much should we fund? How well is the VET system working?
- Providers – what training should we provide, how should we deliver it, in what quantities and at what cost?
- Industry/Employers – will the supply and quality of graduates from the VET system be adequate given our current skill needs and those of the future?
- Students – what qualification should I study for and where should I obtain it?

At the federal government level, Skills Australia uses VET data to provide advice to the Minister for Education, Employment and Workplace Relations (DEEWR) on Australia's current, emerging and future workforce skills needs and workforce development needs.

In Australia VET is primarily the responsibility of the state governments and the majority of VET is provided by the state owned TAFE (Technical and Further Education) institutes. Public funds are allocated directly to TAFE and to other public providers (who are

funded via a competitive tendering process) according to supply-side estimates of the expected demand for skills. To quantify demand and supply, the government uses a General Equilibrium Model of the economy and supplements the resultant output with qualitative information gleaned from employers and industry groups.

In South Australia (SA), for example, the Training and Skills Commission (TaSC) develops a five year plan for skills and workforce development, that informs the SA Department of Further Education, Employment, Science and Technology's (DFEEST) allocation of funding for training places in the state. The TaSC uses an economic development scenario prepared by the SA Economic Development Board (EDB) as the basis for estimating future job openings and associated demand for qualifications. Key inputs to this process are the MONASH model (a general equilibrium model of the economy), and the Monash Centre for the Economics of Education & Training (CEET) estimates of skills deepening and replacement rates for SA. This quantitative data is verified with qualitative sector level information obtained from employers at the national level via Industry Skills Boards.

An important framework to aid the measurement of the demand for skills is the Australian Standard Classification of Occupations (ASCO<sup>3</sup>), developed by the ABS. This framework (shown in the table below) maps qualifications and occupations and thus enables forecasters to measure skills in meaningful terms. It is important to recognise, however, that the observed link between qualifications and occupational destinations is relatively weak and thus places limitations on the accuracy of outputs from any modelling using this framework.

**Table 2: ASCO major groups and requirements for skills levels (qualifications)**

| ASCO Code | Major group                                    | Skill level | Education and experience                            |
|-----------|------------------------------------------------|-------------|-----------------------------------------------------|
| 1         | Managers and Administrators                    | I           | Bachelor degree or higher                           |
| 2         | Associate Professionals                        | II          | Diploma/advanced diploma                            |
| 3         | Tradespersons & related workers                | III         | Certificate III or IV                               |
| 4         | Advanced clerical & service workers            | III         |                                                     |
| 5         | Intermediate clerical, sales & service workers | IV          | Certificate II                                      |
| 6         | Intermediate production & transport workers    | IV          |                                                     |
| 7         | Elementary clerical, sales & service workers   | V           | Certificate I OR completion of compulsory schooling |
| 8         | Labourers & related workers                    | V           |                                                     |

Source: ABS, 1997, Australian Standard Classification of Occupations (ASCO), 2nd Ed

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<sup>3</sup> In 2006 the framework was updated to include New Zealand occupations and became the Australian and New Zealand Standard Classification of Occupations (ANZSCO). We use the previous ASCO framework for the sake of simplicity.

Over the past decade, Australian federal and state governments have established a comprehensive set of objectives for the national VET system and key performance indicators (KPIs) to measure progress against those objectives. The administrative data collected by NCVER (i.e., the national VET collections) are used by policy makers and VET administrators to measure the performance of the VET system against the KPIs.

Student decisions about what and where to study are currently determined by the allocation of subsidised training places (subject to there being enough student interest to fill the available places). Recent reforms will move the Australian VET system towards a 'user choice' model in which government funding will follow students who are free to choose their field of study and the institution at which to study. Since the role of information in the user choice approach is central to the capacity of students to make good decisions about what and where to study, Australia is increasing its focus on capturing information on student outcomes and career paths. Australia does not currently track individual students and graduates in a systematic way and therefore needs to rely on survey data collected by NCVER to assess outcomes. Students seeking information can find it on the Job Outlook website - [jobsearch.gov.au](http://jobsearch.gov.au) – which maintains information on workforce and occupational characteristics including; future growth prospects, average weekly earnings, the skills needed to perform work tasks, typical work activities. However, data on the quality and performance of providers is not publicly available.

In summary, VET data is collected in a variety of ways; administrative data from providers, regular surveys, and ad-hoc surveys. A national VET centre, NCVER, manages the collection of administrative data from providers as well as important surveys designed to capture outcomes data. There is increasing level of awareness of the importance of outcomes data in Australia. VET relevant data is also collected by the national statistical organisation, ABS, in regular surveys of the labour force and education as well as other non-regular surveys. The data from these sources is available at the national and state levels. Industry Skills Councils play an important role in providing sector level data. Government uses these data to inform decisions about training provision, to forecast future skills needs and to monitor the performance of providers. Students use these data to inform career related decisions.

## 1.3 Examples from the European Union

We now highlight some examples/ideas of how TVET data is collected and used in a small selection of European Union (EU) member states.

### 1.3.1 England

A key source of data in England is the National Employer Skills Survey (NESS). It is produced by the Learning and Skills Council (LSC) - the national planning and funding agency for TVET – in partnership with the UK Commission for Employment & Skills. It involves over 79,000 interviews with employers of different sizes across different sectors and localities in England. All establishments with at least two people working in them were within the scope of the sample, but single-person establishments were excluded (LSC, 2008b). In addition to the main NESS survey, a separate follow-up survey is conducted with employers identified during the main interview as providing training to

their staff. The purpose of this subsidiary research is to estimate the cost to employers of providing training. In 2007, a total of 7,190 employers provided data for the cost of training survey, with the sample selected such that it was representative of the profile of employers providing training by establishment size, region, sector and the type of training provided (off-the-job only, on-the-job only or both) (LSC, 2008b).

Data collected by the NESS includes:

- Number and share of vacancies, hard-to-fill vacancies and skill-shortage vacancies by size of establishment; Vacancies and skill-shortage vacancies by occupation; Main skills lacking by occupation where skill-shortage vacancies exist; Vacancies and skill-shortage vacancies by Sector Skills Council
- Skill gaps within the existing workforce; Distribution of skill gaps by occupation; Main causes of skill gaps; Incidence of skill gaps by region; Incidence and number of skill gaps by sector.
- Training and workforce development activity and planning; Training days per annum (overall and per capita); Total training costs and training cost components; Training activity by sector; Reasons for not providing training.

The Learning and Skills Council (LSC) has recently introduced the 'Framework for Excellence' programme, which is designed to collect data to assess provider performance. The data collected will underpin a new performance assessment system linked to performance standards. The LSC will make this information about provider performance available to students and employers to help them choose the right learning experience. The programme is also expected to support planning and commissioning decisions by LSC. The LSC anticipates that the data will come from multiple sources, but in particular a learners' destinations survey and an employers' survey. A pilot exercise has been conducted by LSC (LSC, 2008a).

Sector specific intelligence is also collected via Sector Skills Councils (SSCs). The SSCs are employer-led bodies that set training strategies for particular sectors of the economy and facilitate the development of Sector Skills Agreements (SSAs)<sup>4</sup> which map out exactly what skills employers need to have and how these skills will be supplied both now and in the future. There are five stages in the process:

- Stage 1 - An assessment is made of each sector to determine short-term, medium-term and long-term skills needs and to map out the factors for change in the sector.
- Stage 2 - Current training provision across all levels is reviewed to measure its range, nature and employer relevance.
- Stage 3 - The main gaps and weaknesses in workforce development are analysed and priorities are agreed.

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<sup>4</sup> SSAs are created by a process which involves a number of partners including employers through their Sector Skills Councils, trade associations and employer bodies, and organisations that supply and fund education and training - <http://www.ukces.org.uk/sector-skills-councils/about-sscs/sector-skills-agreements/>

- Stage 4 - A review is conducted into the scope for collaborative action engaging employers to invest in skills development to support improved business performance and an assessment is made into what employers are likely to sign up to.
- Stage 5 - The final outcome is an agreement of how the SSC and employers will work with key funding partners to secure the necessary supply of training.

In the past England has suffered from a fragmented institutional structure for VET data management (OECD, 2009). To remedy this inadequacy, England established the Information Authority in 2006 and the Data Service in 2008. The Information Authority sets and regulates data and collection standards for further education (FE) and training provision in England. It makes decisions on: the data standards that will be used in collection and reporting; the data items to be collected; what information will be made available and disseminated and the rules for its use, e.g. the use of 'early findings' reports; the purpose of data sharing; and how data might be shared; how frequently data will be collected and reported; data quality; the cycle, timetable and processes for changes to collection and reporting – including receiving, assessing and ruling on bids for new data items and reports. The Data Service is an independently managed organisation, established and funded by the Department for Business, Innovation and Skills and supported by the LSC. The Data Service is responsible for managing the collection, transformation and dissemination of all FE data. The Data Service in consultation with statisticians from the Department for Business, Innovation and Skills and the Department for Children, Schools and Families produces a quarterly National Statistical First Release (SFR) on post 16 education learner participation and outcomes in England. The SFR also includes information from the Labour Force Survey on the level of highest qualification held in England, and information on vocational qualifications awarded in the United Kingdom.

### 1.3.2 Ireland

In Ireland the Economic and Social Research Institute (ESRI) conducts a School Leavers Survey. The School Leavers Survey is based on a national sample of school leavers, who are contacted one year to 18 months after leaving school. Since its beginning in 1980, face-to-face interviews have been used to administer the survey. However, face-to-face interviews have become more difficult as a result of high costs (McCoy, Kelly, and Watson, 2007). The most recent School Leavers Survey was conducted in 2007 and used a variety of approaches, including the option of completing the survey questionnaire online, via a paper copy or face-to-face. Participants were also offered an incentive to complete the questionnaire, their names entered in a draw for one of eleven prizes, in order to raise response rates (OECD, 2010a). The OECD notes "The School Leavers Survey was stopped recently because of budgetary cutbacks" (p. 54).

One limitation of the ESRI School Leavers Survey, as noted by the OECD, is that the results are not broken down by programme or even occupational field. This means that it is not possible to identify which programmes have stronger and which ones have weaker outcomes. It is important, for the purposes of informing decision makers, to ensure the level of data collected and presented is at a sufficient level of detail.

### 1.3.3 Norway

VET outcome data is collected via survey in Norway. The key 'user' survey is the Lærlingsinspektørene, which is a nationwide, internet based questionnaire about students' and apprentices' own evaluation of the training environment in schools and companies. The study has been conducted three times since 2002, and provides information about wellbeing and the work environment, bullying, individual follow-up, co-determination, motivation, evaluation of instruction and advising, and satisfaction in a number of areas (OECD, 2009a).

### 1.3.4 Sweden

Sweden does not need to collect outcomes data via surveys since it operates a central population register that attaches a unique identifier code to each individual (OECD, 2008b). This identifier is in turn attached to a range of administrative data sets, including education, labour market and tax records. Since the use of these personal data is authorised by law it is possible to track individual education and employment histories and thus to analyse the links between VET and later labour market experience. A number of countries outside the Nordic region have plans to introduce similar systems. In Switzerland, for example, from 2010, an individual student number will link data on education and work making it possible to trace individual students' careers.

In Sweden publicly funded VET is concentrated at the upper secondary level. Given the decentralised structure of the Swedish school system most upper secondary schools are managed by municipalities. Each municipality is required to establish objectives for its schools in a school plan. Each year, the school submits a 'quality review' to the municipality and the municipality delivers its report on the quality review to the National Agency for Education (Skolverket) (OECD, 2008b). This information is an important source of supply-side information.

### 1.3.5 Czech Republic

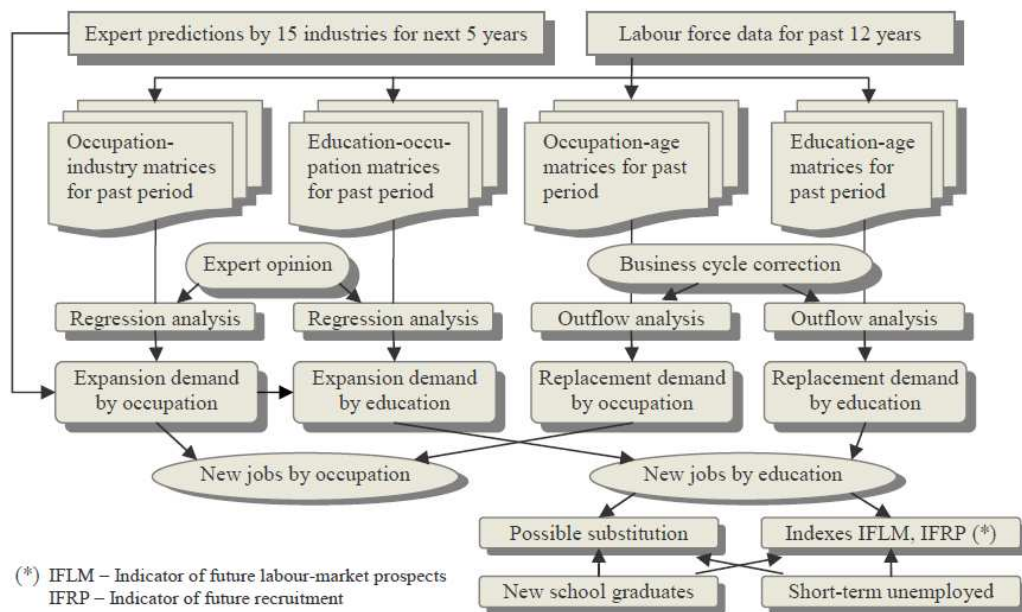
Rich and easily accessible labour market data and information on educational options are a strength of the Czech VET system (OECD, 2010b). The National Institute of Technical and Vocational Education (NÚOV), for example, has developed a labour market information system for both teaching and advising staff and graduates to support them in making career choices ([www.infoabsolvent.cz](http://www.infoabsolvent.cz)).

"The country has started actively developing the system of anticipation of skill needs during the last decade. It is based on medium-term macro-level quantitative forecasting which incorporates some qualitative elements of sectoral projections. In parallel qualitative sectoral surveys covered several selected sectors and are now planned to be linked to a more permanent system of sector counsels. Although there is no developed system yet, several efforts at national, regional and sector levels aim at a more systematic approach." (Cedefop, 2008, p. 26)

The model used for forecasting skill needs in the Czech labour market has been adapted from the model of the Dutch Centre for Education and the Labour Market (ROA) by the Centre for Economic Research and Graduate Education of Charles University (CERGE – EI) in Prague. This model forecasts the demand and supply side of the labour market separately for any given educational and occupational group in the medium term

(Cedefop, 2007). The most important statistical data source available for modelling future skills needs is the quarterly labour force survey (LFS) compiled by the Czech Statistical Office. The LFS is based on a sample of almost 30 000 households, 20 % of the sample is replaced quarterly. The figure below illustrates the current main method used for mid/long-term forecasting of skill needs at macroeconomic level in the Czech Republic.

**Figure 2: Method for mid/long-term skills forecasting in the Czech Republic.**



Source: Cedefop, 2007, p.63

## 1.4 USA

The US Department of Education has a broad policy-making role and provides some funds for special VET programs, but beyond this management and funding for the provision of VET (and education generally) is devolved, to the county level, with considerable variation among the states (OECD, 2009a). Most continuing VET is delivered by private providers or company in-house programs with relatively little public funding or regulation. The national government does play an indirect role however, through the way in which it provides student loans and grants to VET students. For example, its capacity to limit access to student loans and grants as a function of student employment outcomes acts in effect as an accreditation and quality control mechanism, since provider publicity often places great emphasis on student outcomes (OECD).

In 2007, The US Department of Education launched the 'College Navigator' to help students make informed decisions about post-secondary education and training options (<http://nces.ed.gov/collegenavigator/>). It allows users to search for and compare public and private post-secondary training providers using a range of criteria including total enrolment, programme offerings, degrees and certificates conferred, graduation and tuition rates, and geographic location (OECD, 2008a).

The USA states also conduct skills forecasting and in contrast to the method used in Australia to map occupation with skill level, the USA uses occupation-education clusters. The Bureau of Labor Statistics (BLS) created educational attainment cluster system, assigns each occupation to an 'educational attainment cluster' based on the educational attainment of current workers in the occupation. As shown in the table below, occupations are grouped according to the percentage of workers who have a high school diploma or less, some college or an associate degree, or a college diploma (bachelor's degree) or higher. According to the percentage of workers falling into each of these three educational levels, the occupation is assigned to one of six hierarchical education clusters.

The cluster classification system can be used to assess the future education requirements. The number of jobs in each of the six cluster categories can be projected, and these projections can be combined and modified to project the number of jobs to be filled by those with a high school diploma or less, those with some college, and those with a bachelor's or higher degree. The education clusters approach may be useful in understanding the functional and pragmatic links between occupations and qualifications and therefore assist analysis and planning of skills demand within industries.

**Table 3: Definitions of education clusters**

| <b>Education clusters</b>                  | <b>Percentage of employees aged 25 to 44 in the occupation whose highest educational attainment is –</b> |                                                  |                                  |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------|--------------------------------------------------|----------------------------------|
|                                            | <i>No post-school qualifications</i>                                                                     | <i>Some college (including associate degree)</i> | <i>Bachelor or higher degree</i> |
| High school (HS)                           | Greater than or equal to 60%                                                                             | Less than 20%                                    | Less than 20%                    |
| High school/some college (HS/SC)           | Greater than or equal to 20%                                                                             | Greater than or equal to 20%                     | Less than 20%                    |
| Some college (SC)                          | Less than 20%                                                                                            | Greater than or equal to 60%                     | Less than 20%                    |
| High school/some college/college (HS/SC/C) | Greater than or equal to 20%                                                                             | Greater than or equal to 20%                     | Greater than or equal to 20%     |
| Some college/college (SC/C)                | Less than 20%                                                                                            | Greater than or equal to 20%                     | Greater than or equal to 20%     |
| College (C)                                | Less than 20%                                                                                            | Less than 20%                                    | Greater than or equal to 60%     |

Source: BLS (2008)

## 1.5 Sri Lanka

Over the last decade the Sri Lankan TVET system has undergone significant reform with the purpose of making it more demand-driven or industry-led and it can be considered more advanced than Bangladesh's TVET system. Some of these reforms include; the development of a labour market information system (LMIS) and Research Cell; developing links to industry bodies and trade associations and supporting them to take ownership of skill development in their respective sectors; and, improving TVET coordination and planning at the provincial level using provincial level information.

### 1.5.1 TVEC

The Tertiary and Vocational Education Commission (TVEC) is the key organisation responsible for the planning, coordination and development of technical and vocational education and training (TVET).

Since 1995 all TVET providers have been required to register with TVEC. As a requirement of registration, training providers must report data annually to TVEC. As such, TVEC is able to quantify the number of students and training places. From this registration data, TVEC produces the TVET Guide for students, which contains information about TVET opportunities available at the public sector training institutions.

### 1.5.2 Labour Market Information System (LMIS)

The TVEC is also responsible for maintaining the country's Labour Market Information System (LMIS). The purpose of the LMIS is to provide a detailed picture of the supply and the demand for labour at the occupational and industry level. The main sources of information for the LMIS is the quarterly labour force survey data from the Department of Census and Statistics, TVEC's own survey of job vacancies advertised in newspapers, and Foreign Employment Bureau data on job orders and departures. The collected data is analysed and presented in the Labour Market Information Bulletin, which is published biannually by TVEC. Information contained in the bulletin covers:

- recruitment and completions in TVET
- employment and unemployment of persons with TVET qualifications
- job advertisements by gender, occupation, industry, formal/informal methods, education attainment, requirements
- remuneration levels of local jobs and foreign jobs disaggregated by gender, occupation, industry,
- new employment opportunities by industry and occupation as determined by investment in major projects data
- unemployment by gender, industry, occupation, trends in unemployment
- foreign jobs in demand – ranked on the basis of the number of jobs placements offered to Sri Lankan employment agencies by their foreign principals
- departures and placements by gender, skill level; levels of jobs

### 1.5.3 Statistical organisations

#### 1.5.3.1 Research Cell

The TVEC have also recently established a 'Research Cell' to undertake and coordinate TVET research and analysis. The Research Cell coordinates tracer surveys to gather information on students post completion, conducts exploratory and empirical research (e.g. to research the economic and social benefits of TVET), and complementary case studies involving qualitative data.

#### 1.5.3.2 Department of Census and Statistics

The Sri Lankan government Department of Census and Statistics also regularly collect, compile and publish basic labour statistics. A quarterly Labour Force Survey has been conducted in Sri Lanka since 1990. The Labour Force Survey is typical of labour force surveys worldwide in that it collects data designed to measure the levels and trends of employment, unemployment and labour force. To assist in the analysis of labour market data, the department uses ISCO and ISIC. The department also collects additional data on literacy, household economic activities, informal sector employment and underemployment and conducts an annual survey of industries, which gathers data on employment and earnings of employees.

In addition, the labour statistics division of the Department of Labour is also responsible for analyzing and publishing information collected through annual and bi-annual surveys and administrative records maintained by the Department of Labour and other institutions.

#### 1.5.4 Sector skills councils

Sri Lanka is currently investigating models for sector skills councils to inform the TVEC of skills needs at both the regional and national levels and assist in aligning TVET more closely with industry.

#### 1.5.5 Sector specific data: Office Management Sector

- In Sri Lanka, across various sectors, employers have complained that the TVET system often fails to meet the requirements and expectations of the industry, whilst past students on the other hand complain that the training they have received in the TVET sector does not meet the requirements of the sectors they are employed in. The Office Management (OM) Sector is one sector which is attempting to resolve this problem by gathering data to prepare a sector specific TVET plan that will satisfy the requirements of both students and employers. On behalf of the TVEC, the Skills International (Pvt.) Ltd. has undertaken three sample surveys to collect relevant data to prepare a five year human resources plan for the OM sector, as detailed below:
- Sample survey of Training Institutes (Trainers)
- The survey was conducted by selecting 159 training institutes in the state, private, statutory boards, foreign collaborated institutions (BOI) and NGO sector in 15 identified districts.
- Sample survey of employers who engage employees of OM sector
- Enterprises and industries which employ human resources relevant to the OM sector were selected on the basis of size and the number of employees in each firm.
- Employers were surveyed to: gather information from the employers regarding the relevancy of the training programmes their employees have undergone; find out the present needs of their employees with regard to training; the future demand for human resources in the OM sector and; ascertain the type of training they should undergo

- Sample survey of employees in the OM sector
- Information was obtained on: the quality of training – duration, curriculum, evaluation; the usefulness of the training to find employment; the future need; the quality of trainers; the link with industry; facilities for training; age of trainers; the qualifications of the trainers; distribution of employees gender wise

In addition, it has utilized the information and data available with the following institutions for development of the VET plan:

- Department of Census and Statistics
- The Central Bank of Sri Lanka
- The Sri Lanka Bureau of Foreign Employment
- Other reports and publications relevant to the OM sector

These data are then used to estimate skills needs in the sector and the supply of and demand for training.

Labour requirements for the OM sector are estimated by using the following methods:

- Step 1 - Examination of the number of currently employed persons in the OM sector in Sri Lanka.
- Step 2 - Examination of the relationship between the growth patterns of the number of currently employed persons in the OM sector and the industrial production sector
- Step 3- Study of the employees in the OM sector seeking employment abroad and the estimated future job seekers abroad.
- Step 4- Survey of job advertisement for OM positions locally and abroad that appear in the newspapers
- Step 5 - With the collaboration of the above estimations and the results of the survey estimate the labour requirements of the OM sector for the next five years

## 1.6 India

In 2002-03, the ILO (2003) conducted an evaluation of the internal and external efficiency of the Industrial Training Institutes (ITIs) in India. The study identified a number of challenges in the Indian system, in particular demand-supply imbalances;

*The ITI training programmes are decided centrally by State Directorates of Technical Education and Industrial Training and obviously do not match the local demand for skills. No labour market assessment surveys have been applied regularly to check the potential demand for skills. Graduates' labour market success has also not been examined. As a result, ITI courses continue to have only far-fetched links with the local labour markets (p.xiii)*

The study also concluded

*The above imbalances of supply of graduates and demand for them may only be corrected through regular surveys of both organized and unorganized sectors as well as of the graduates' labour market destinations and making judgments on the best mix of training courses (p. 27).*

This advice also applies to Bangladesh.

One of the main sources of information for skills planning in India is the National Sample Survey (NSS) conducted by the census bureau that provides data on wages and education levels. However, the World Bank (2008) commented on the National Sample Survey (NSS) and noted that it does:

*not allow for a clear distinction between vocational education and general secondary education, and between vocational training and tertiary education. Hence, it is very difficult to do any detailed analysis of vocational education or vocational training on the basis of NSS data 9p. iv).*

India also has been unable to measure labour market outcomes of VET graduates. In the EU and Australia, as well as Sri Lanka, data on student outcomes are recognised as imperative.

*There have been no impact evaluations that have been conducted which examine the wage and employment outcomes for graduates of these institutions as compared to those for a control group of individuals who did not participate in these programs. This makes it difficult to make informed decisions about the effectiveness of vocational education or vocational training programs (p.iv).*

## 1.7 Summary

Clearly there are a number of differences in the way countries assemble and use data to inform their VET sectors. Often these differences are a product of the culture within which they have evolved as well as a function of the resources available to individual country governments. However, it is possible to identify some common trends which can be termed good practices in the development of a TVET data system in Bangladesh. These trends include:

- One way of strengthening the research base on TVET is to establish a specialised research institute, responsible for overseeing the collection and analysis of TVET data and disseminating research findings
- The development of sector skills councils in priority industries as a mechanism for obtaining information, particularly regarding broad trends in the demand and supply of skills and the way skills will be used in the future to feed into skills and workforce planning
- The use of standard classifications to enable comparable evaluations across regions, and even internationally.
- Standard classifications of occupations and qualifications enable qualifications and occupations to be mapped (although methods for doing so vary) and thus used a tool for forecasting skills

- Quantitative data and qualitative data are both important in workforce and skills planning, however methods for incorporating qualitative with quantitative data are unclear
- Labour market outcomes of VET graduates are a fundamental measure of the extent to which VET programmes are meeting labour market needs, helping VET institutions to adjust provision to labour market needs and public authorities to support the most relevant programmes and institutions. Data also help students to choose career paths (OECD, 2009). The key ways to obtain outcome data are:
  - Systematic surveys of those who have recently left VET institutions.
  - Census and survey data relating labour market information to VET qualifications or occupations that use VET qualifications.
  - Sample longitudinal surveys following a cohort of young people through VET and later transitions
  - Full longitudinal datasets, linking VET administrative records to later experience including employment experience through an individual reference number
- To inform TVET stakeholders, TVET data must be available, accessible, and up-to-date
- Good detailed data costs money. The benefit of collecting costly data must be weighted against the cost of collection and management. Also, the benefits of data sets are greatly enhanced if they can be collected consistently over time and so the question of whether the collection and management effort can be sustain over time is also relevant. This is particularly relevant in a resource poor nation such as Bangladesh.

## 2 Current TVET data, expertise and capacity

### 2.1 Overview

On behalf of the ILO, during late October and early November 2009 the National Institute of Labour Studies (NILS) conducted over 25 interviews with a range of local stakeholders in Bangladesh from government, industry and TVET providers.

The purpose of the consultations was to identify the key users of TVET data, the decisions they must make that require TVET data and the appropriateness of existing TVET datasets for such decision-making.

The field programme also included collection and examination of documents from stakeholder organisations as well as documents produced by the ILO regarding the Bangladesh TVET Reform project and other related projects.

### 2.2 Summary of general findings from consultations

The following statements are a brief summary of the key findings of the consultations:

- the delivery of TVET courses is dispersed across many government and private agencies with up to 19 GOB ministries delivering some form of TVET course, either formal or informal and there is no consolidated data on the nature or scope of these programs.
- one of the key distinctions amongst TVET courses is whether they are affiliated or not with the Bangladesh Technical Education Board (BTEB). Formal TVET programs are affiliated with BTEB, non-affiliated programs are considered informal.
- affiliated or formal courses tend to be of longer duration, include structured assessments and lead to the award of national qualifications.
- courses that are affiliated with BTEB have their curriculum and examinations set by BTEB.
- BTEB is a key source of TVET data as it holds consolidated datasets of public and private TVET institutions providing affiliated courses. These include student details and records of assessment results.
- The labour force survey (LFS) and other collections from the Bangladesh Bureau of Statistics (BBS) are considered of limited value for skills planning. The LFS, for example, provides data at only the 1-digit level and therefore cannot directly provide information that is useful for detailed demand forecasting for TVET.

- the assessment of the demand for skills by employers, both local and overseas, is piecemeal and ad hoc and stakeholders were unanimous in their view that demand assessment needs to be systematised and improved.
- the informal economy is very large, employing around 80% of the workforce
- the size of skill shortages are large relative to the numbers of graduates being produced by the TVET sector
- student applications for TVET courses are generally well in excess of the number of places available-- often anywhere between 3 to 10 times the number of available places
- Bangladesh's economic growth is substantial - around 6% per year - and insufficient skills is increasingly constraining growth
- as Bangladesh attempts to increase the quality of output, especially from its manufacturing sector, the level of available skills is a constraint. Textile and garment sector representatives also reported that a shortage of skilled employees is constraining the level and quality of output
- overseas workers are very important to the Bangladesh economy, with their remittances constituting the largest source of foreign exchange for Bangladesh
- some 6 to 8 million Bangladesh workers are currently overseas primarily in the Middle East and the GOB wants this stock of overseas workers to continue to increase
- a number of stakeholders indicated that the demand for skills by overseas employers is also increasing significantly and that, if skilled workers can be provided, that wage rates and remittances would increase
- industry generally hold the view that the quality and relevance of TVET programs is inadequate
- Industry Skills Councils (ISC) in Bangladesh are likely to have a key role in any future data collection on the demand for skills.<sup>5</sup>

It is important to emphasise that interviewees often found it difficult to articulate specific business decisions that were dependent on specific types of TVET data and rather emphasised a generic need to understand the demand for skills from industry and overseas and to achieve better matching of the output of the TVET system with the demand for skills from industry.

Another view that was strongly emphasised was that Bangladesh's TVET system was 'fragmented' and 'disorganised' and there was wide-spread support for the proposition that there was a need for improved management and responsiveness to the demand for skills.

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<sup>5</sup> The NSDC Action Plan and the draft National Skills Development policy both identify ISCs as a feature of the future Bangladesh TVET system. In particular, the draft skills policy identifies a key role for them in providing data on the industry demand for skills.

## 2.3 Datasets related to TVET

There are a numbers of existing datasets that are relevant to managing the TVET sector in Bangladesh. These include:

- BBS census – the national census is available source of population wide characteristics on educational attainment and occupation
- BSS labour force survey – a household-based survey which appears to be undertaken every 3 to 4 years and collects information about educational attainment, occupation, average hours worked and earnings. Again, this is useful for population wide summary measures but is not sufficiently detailed to be of direct use in planning optimal TVET enrolments.
- BBS census of manufacturing industries (CMI) – this survey appears to occur every three or four years and collects occupational data which can be cross tabulated by industry. This is useful information but perhaps insufficiently detailed for broader skill demand forecasting purposes.
- BTEB holds data on an individual student unit record basis for BTEB affiliated courses.
- Data on TVET training delivered by various ministries – this is likely to be relatively detailed administrative data and the relevant ministries are likely to be the only source of non-affiliated data on training in the public sector. Currently this data is not centrally held
- Data on institutions held by the Bangladesh Bureau of Educational Information & Statistics (BANBEIS) – a central resource for data on all aspects of the education system which does not specialise on the TVET sector but appears to replicate some data held at BTEB relating to some public TVET providers including course details, enrolments and graduations. These are published irregularly but have been assessed as reliable (ILO, 2008)
- Data on private providers are also not published regularly. Private providers do collect their own data but do not publish it (ILO, 2008).

### 2.3.1 Existing data, IT infrastructure and expertise in Bangladesh

#### 2.3.1.1 Existing data sources and gaps

The main sources of information for this project on existing TVET data in Bangladesh have been interviews with stakeholders and the ILO publication, *Availability of Data related to Technical and Vocational Education and Training (TVET) in Bangladesh*.<sup>6</sup> This document provides summaries of TVET and relevant industry data produced by DTE, BMET, BTEB, BBS and others.

Many of the stakeholders interviewed commented that the Bangladesh TVET system is highly fragmented. Whereas it is common globally to find public and private TVET

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<sup>6</sup> Availability of Data related to Technical and Vocational Education and Training (TVET) in Bangladesh, Project Research Report Series BD: 2/80, Md. Nurul Islam, ILO Dhaka, 2008.

institutions operating in parallel, it is less common to find numerous TVET institutions under a variety of ministries. This structure does lead to a relatively high level of fragmentation. For example, the various agencies operating under their respective ministries are not required to provide data about their courses for students on a consolidated basis to any central TVET authority (unless their courses are affiliated). In addition, administrative data from private TVET providers is not aggregated. This lack of centralisation and aggregation means that it is difficult and costly to form a picture of the skills and qualifications being created by the TVET system in any year.

Stakeholders also typically commented that the TVET system needs to better meet the needs of industry and this was often expressed in terms of the supply of skills needing to better match the demand for skills. As we discuss below, there are significant definitional and conceptual challenges in meaningfully identifying supply and demand for skills and qualifications. As an additional problem, the various sources of data which might assist in identifying the demand for skills and qualifications are generally of insufficient detail to be useful, for example, the BBS LFS categorises occupations at only a first digit level and qualifications are classified only in the form of higher level educational attainment. Generally speaking, not enough is known about the occupational and qualifications structure of employment in Bangladesh to underpin the allocation of resources to specific TVET training.

On a more positive note, BTEB aggregates data for students of BTEB-affiliated courses. Students undertaking BTEB-affiliated courses account for the majority of advanced (higher NTVQF) TVET education in Bangladesh. BTEB's datasets are therefore a very valuable asset for the development of a new TVET data system. Fortunately, BTEB holds significant amounts of data stored as individual student unit records. The distinction between individual unit record data and aggregated data is an important one. Unit record data is 'primary data' whereas aggregate data is secondary data compiled from various primary sources. Unit record data is highly preferable for many reasons, primarily because it provides open ended flexibility for it to be aggregated in various alternative ways and presented in many different summary formats. Unit record data is highly valuable for research purposes and, in particular, if unit record data is collected over significant time periods, it is far more likely that incisive and insightful research can be conducted using this type of data compared with various summary or aggregate forms. This type of data and related research is of direct relevance to improving demand and supply matching of skills because as knowledge and experience of the TVET system develops new objectives and questions that cannot be currently anticipated will emerge. Whereas aggregated data is limited, disaggregated data can potentially provide answers to new questions and enable further fine-tuning of the system.

One of the distinctive problems that Bangladesh faces in managing the TVET sector is the level of demand for Bangladeshi workers from overseas. Overseas workers have become increasingly important to the Bangladesh economy and our consultations with stakeholders suggest that the stock of Bangladeshi workers overseas will continue to grow over time. At the current time approximately six million Bangladeshis are working overseas. Therefore it is necessary to include the demand for skills from overseas in any calculations of Bangladesh skills demand. BMET currently collect data in detailed form on Bangladeshi workers departing for overseas employment and this data can provide a picture of the skills that are leaving Bangladesh. It is not clear, however, that the skills of

expatriate Bangladeshi workers are a good match for the needs of overseas employers. Currently, no surveys are taken of returning workers. Such surveys could provide useful intelligence about the skills which are in demand in overseas markets and the inflow of skills to Bangladesh from these returning workers and this type of survey forms one of our recommendations.

The ILO report on TVET data in Bangladesh (ILO 2008) provides a good summary of data sources relevant to the TVET sector in Bangladesh. It also proposes that new and more detailed datasets be collected (see Tables D17 and D18).

It should be noted however, that even data of this detail does not eliminate the associated definitional and practical problems. Regard must be given to the cost of collecting data at this level of detail, and we believe that it would be an expensive exercise to collect such detailed occupational and qualification data across even the target industries for the TVET reform project.

There is also a need to improve the standards for occupational and qualification classifications and it is recommended that the proposed ISCs be tasked with developing more detailed occupational and qualification data on an industry basis that conforms to a Bangladesh implementation of ILO's 2008 ISCO and the new proposed NTVQF. The objective would be for each ISC to build a deep understanding and a mapping of industry specific occupations and skills to TVQF levels and/or specific TVQF qualifications. As knowledge and techniques are built up in priority industries, the ISCs in those industries can pass on techniques to other ISCs. Exchange of techniques and knowledge between ISCs should also be strongly encouraged.

Whilst the priority for the TVET data system in Bangladesh is to improve skills demand data, gaps are also evident in the administrative data. In particular, no data is collected regarding the level of applications by students for various courses. This needs to be collected by each institution and aggregated by a central agency. Stakeholders commented that applications are sometimes ten times greater than the number of seats available and this type of data provides valuable information about what students regard as the most desirable courses. The need for this type of data is described in Table D07 of the ILO data report (ILO 2008). Also, no data is consistently gathered at an aggregate level on student outcomes post graduation. Of particular interest is the success of graduates from various courses in finding employment directly related to their qualification. This again, is a useful source of information on the demand for skills and also highly valuable information for students making choices about which course to take. It is also useful for TVET institutions that have discretion in determining what courses should receive additional resources.

#### **2.3.1.2 IT infrastructure**

The level and quality of IT infrastructure among Bangladesh TVET providers is difficult to assess and, in any case, is a rapidly moving target. For example, discussions with stakeholders indicate that almost all of Bangladesh now has mobile phone and data coverage. This potentially means that any TVET provider is in reach of at least a wireless data connection point. Whereas it will be the case that smaller TVET providers in the informal sector may have little or no IT infrastructure this can also rapidly change and it nonetheless seems a reasonable assumption that any significant TVET provider has

some minimal IT infrastructure and the potential to connect to the Internet. If this is not the case already it will certainly be possible at relatively low cost in the near future. This has important implications for the design and operation of data collection and management systems.

The field phase of this study included visits to BBS, BANBEIS, BTEB and BMET. The following information regarding IT software infrastructure was provide to ILO:

#### **Software resources in BBS**

Operating systems: DOS, Windows/2000/XP, UNIX, Linux, Sun Solaris, Windows NT, Windows 2003 Server. Application software is MSOffice, IMPS, Bangla software. Programming Language is COBOL, FoxPro, Visual Studio. Database is based on CPro, FoxPro, Oracle with Developer. For analysis: SPSS, STATA. GIS Software: Arc Info, Arc View, Erdas Imagine. Graphics software is based on Harvard Graphics, Adobe collection.

#### **Software resources in the BTEB**

Student data is collected using OMR (Optical Mark Recognition) forms which are converted into text form by Oracle data loader. Operating systems: Windows and Linux (server is based on Linux). Queries: Oracle SQL and TOAD. Crystal Report Software used for reporting. ICR (Intelligent character recognition) for converting any written number data into digital form.

#### **Software resources in the BANBEIS**

Information is collected by structured questionnaire. Data stored in Oracle database systems. Operating system: Windows. Queries: TOAD. Developer 2000 used for reporting. SPSS is used for analysis. GIS software: Arc View. Currently are running a GPS survey.

It is clear that all of these organisations have significant IT capacity and would be able to manage some or all of the datasets associated with the TVET data system. BANBEIS, in particular, demonstrated a high level of IT capability and it is pertinent that its expertise is in the education domain. The proposed NSDC secretariat (NDC) obviously has no IT capacity and an important question is the extent to which it should develop its own IT capacity or outsource IT activities to another agency. It will be difficult in the short run for a new organisation to acquire IT systems and the expertise necessary to run them. One of the other agencies, for example, BANBEIS, could be subcontracted to perform IT functions. Such an arrangement would not need to be permanent and if desired the new secretariat could assume IT functions incrementally over a future period. We recommend that such outsourcing take place but believe the decision regarding the appropriate agency should be left to the proposed new secretariat.

### **2.3.1.3**

#### **Expertise**

The main types of expertise required to develop and manage the TVET data system in Bangladesh are:

- experience and knowledge about the nature and characteristics of TVET systems in general and how the various types of data produced about the TVET system relate to policy and management decisions

- knowledge and techniques in the management, analysis, storage and processing of TVET data.

The necessary IT and data management capability exist in, for example, in BBS and BANBEIS and potentially some of the other ministry agencies such as BTEB, DTE and BMET. It is recognised, however, that it will probably be necessary to set up an independent data cell for the purposes of overseeing and perhaps managing the TVET data system.

It is also necessary to consider the expertise of the TVET providers themselves who will be required to contribute data to the system on an ongoing basis. The required level of expertise is likely to be a problem only for smaller TVET providers in the informal sector. It is recommended that larger TVET providers in the formal sector be engaged first with a view to including small providers as the system develops but not to delay the implementation of systems because of the inability to participate of small providers in the informal sector. Again, this is further detail in our recommendations in the following section.

## 3 Proposal for TVET data system

### 3.1 Introduction: improving the TVET data system

The objective of the TVET data system is to “inform future policy, management and investment decisions in TVET.” (TOR, p2). The core functional objective is to more closely match the qualifications and skills output of the TVET sector to the demands of industry.

*The ILO recognizes that the planning of pre-employment education and training should align with future employment opportunities and deliver competencies that meet the expectations of prospective employers. In order to improve the capacity of TVET in Bangladesh to meet the demands of the labour market, the TVET Reform Project aims to strengthen the national TVET data system so it can provide timely and accurate information to industry and TVET planners and managers in both the public and private sector. (TOR, p2)*

Thus, the focus of the proposed TVET data system is on improving the matching of the supply of skills and qualifications to the demand from industry *via the output of the TVET sector*. We will also identify data and the means by which it can be collected which relate to the more general objective of informing “future policy, management and investment decisions in TVET”. We will not consider in detail sources of skills and qualifications outside the TVET sector except in so much as they influence significantly the effort to match supply and demand.

### 3.2 Categories of data

In the discussion that follows, we describe proposed datasets for the TVET data system in Bangladesh under three major categories:

- **supply of skills and qualifications data:** – this category covers the output of the TVET sector, net inflows of skills from overseas and net movements into and out of the labour force due to a range of demographic trends such as changes in the age structure of the workforce.
- **industry demand for skills** – data on the demand for skills and qualifications by industry is not directly observable and so must be estimated via a number of proxies. The current composition of qualifications and skills employed by industry does not indicate the current level of demand because there will be existing skill shortages of unknown size and the existing workforce will contain elements of over- and under-qualification within particular occupations. The demand for skills also includes the demand for Bangladeshi workers overseas.
- **data on demand and supply matching** – as is the case with demand for skills, data on the mismatch of supply and demand is not directly observable. Estimates of mismatches can be created by comparing the supply and demand data described above and various proxies can be collected such as hard-to-fill vacancies and

student destination or outcomes data, although it should be emphasised that these are indicative not definitive.

These categories are discussed in more detail in the following sections.

### 3.3 Supply of skills and qualifications data

In this section we identify the sources of skilled and qualified persons in the Bangladesh economy. We describe conceptual issues associated with identifying such supply and identify sources of data which may be used to estimate supply.

#### 3.3.1 Components of supply and conceptual issues

As we will see in further discussion, the phrase ‘the supply of skills and qualifications’ is quite ambiguous in meaning. To further define the term we will first identify the concept of stocks and flows. The value of a stock variable is specified at a point in time whereas a flow variable’s value is specified over a period of time.

The supply of skills and qualifications can be thought of as either a stock or a flow variable. At any point in time it is reasonable to say that there is a given supply of particular skills and qualifications in an economy. When it comes to attempting to measure the size of this stock for particular skills and qualifications, a number of definitional issues arise which make precise quantification extremely difficult. These include:

- the definition of skills, in particular, is imprecise and therefore attempts to quantify the current availability of any particular skill will be hampered by how to define it.
- qualifications tend to be better defined and therefore the definitional issues are less problematic, nonetheless issues arise, such as whether particular qualifications are up to date or of suitable quality.
- another major problem associated with trying to define supply of qualifications is that persons who hold a particular qualification may not be working in an occupation for which that qualification is a requirement, further they may have no intention of ever returning to that particular occupation – an example is someone who began their career as a factory technician and now has become a senior manager. In fact, many persons are likely to hold a particular qualification which they have no intention of using in a future occupation and therefore they should not be part of any estimate of supply where the objective of calculating supply is to make assessments of its correspondence to demand.

Statements about ‘skills shortages’ are statements about stock variables, in particular, that the supply of a certain set of skills is less than the demand at a particular time. Again, this simple concept is one that is, in practice, difficult to quantify.

*Another complication, which is primarily empirical, is that employment data cannot be relied upon to indicate labour supply because the “short side dominates”. This means that in situations where there is an excess supply of labour (demand is “short”) measures of employment will reveal demand, and the excess supply will be manifested as unemployment. In situations where there is excess demand for labour (supply is “short”) supply will be measured in the employment statistics (because some*

*employment vacancies will remain unfilled). This means that observed numbers of employees can not be relied upon to indicate the supply of labour.<sup>7</sup>*

We will return to a discussion on this issue in our consideration of the measurement of demand in Section 3.5.

There are four main sources of increment or decrement to the stock of skills and qualifications:

- the output of the TVET sector
- additions to skills from on-the-job training
- net (of retirements and deaths) inflows of persons with skills or qualifications into the workforce
- net inflows of persons with skills or qualifications from overseas.

The terms ‘qualification’ and ‘skills’ have been used more or less synonymously in the discussion to this point: it is necessary to distinguish between them in the following discussion. ‘Skills’ is the more general term and means a learned ability to perform a particular task. Qualification has a more specific meaning, especially in the context of TVET systems, and refers to a specific set of skills and or competencies that are explicitly taught/learned and recognised by the award of a particular credential. Skills can be acquired through informal learning on the job, or through studying for a qualification. It is very likely that in Bangladesh, a majority of employment skills is learned on the job. A qualification can be granted only by an appropriately registered TVET institution and one of the most important benefits of a qualification for its holder is that it is widely recognised, meaning that the employee has greater capacity to move between different employers.

We will discuss the sources of skills and qualifications in combination but we will later move to a focus on qualifications as the focus of the TVET data system for a number of reasons which will be detailed below in Section 3.5.

## 3.3.2 Sources of data and coverage

### 3.3.2.1 TVET sector

The major source of data on the supply of skills and qualifications from the TVET sector is the administrative data of TVET institutions and the data held by various Government agencies on their training programs.

Table 4 presents a categorisation of sources for administrative data. This categorisation focuses on the role of BTEB in aggregating data about BTEB-affiliated courses and the distinction between public and private TVET providers. Any institution, public or private,

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<sup>7</sup> The Labour Force Outlook in the Minerals Resources Sector: 2005 to 2015 Report prepared for the Minerals Industry National Skills Shortage Strategy, Dr Diannah Lowry, Mr Simon Molloy & Dr Yan Tan, National Institute of Labour Studies, May, 2006, p41-41. – no included in list of references

which provides BTEB-affiliated courses, has, in effect, a subset of its administrative data recorded with BTEB. This centralised dataset is of enormous value to the TVET Reform Project because it represents a valuable starting point in the consolidation of national data on the supply of skills.

**Table 4: Administrative data: sources**

| Sector  | BTEB affiliation    | Data                                                     | Availability of data |
|---------|---------------------|----------------------------------------------------------|----------------------|
| Public  | BTEB-affiliated     | BTEB student unit records and other aggregated data sets | high                 |
|         | non-BTEB-affiliated | Ministry and agency records                              | medium               |
| Private | BTEB-affiliated     | BTEB student records                                     | high                 |
|         | non-BTEB-affiliated | Individual TVET institutions                             | low                  |

As shown in the table above, administrative data is available from a number of sources:

BTEB holds student unit record data on courses, assessed results and demographic data as well as data on registered institutions. BTEB's collections must be regarded as a central source. BTEB holds data for all affiliated courses delivered by registered institutions

Individual ministries hold data about the courses their various agencies provide and this is the only known source of data on the non-affiliated courses delivered by the public sector and the private providers they sub-contract to deliver services

Public TVET providers hold data additional to that held by BTEB for affiliated courses and we recommend that this additional data be collected and collated and that, over time, the standardised student record data model recommended below be adopted

Private and NGO TVET providers hold administrative data for non-BTEB affiliated courses but its quality and coverage is relatively unknown. Stakeholder consultations revealed that some providers operate paper-based administrative systems and the structure and quality of computer-based administrative systems in the private TVET sector is highly variable. Consultations indicated that these types of problems are more likely to be associated with small providers in the informal sector.

Given that TVET activity is dispersed across many public agencies, private providers and community based NGOs, standardising, aggregating and centralising all TVET administrative data from all providers would be a complex and potentially very expensive undertaking. It is therefore advisable to prioritise the collection of administrative data from the TVET sector according to the importance of the data and the cost of its acquisition.

Based on this logic and discussion with ILO, we recommend that the focus of the TVET data system be on BTEB-affiliated courses and publicly provided courses. It is our conclusion that the costs of integrating administrative data for the private provision of non-affiliated courses would be very high and may in fact require legislative change to require private providers to provide their data in prescribed formats.

In any case, we recommend, irrespective of these considerations, that from an economic efficiency perspective, the priority focus should be BTEB affiliated courses. These courses are generally much longer in duration and much more expensive to deliver than the non-affiliated courses. This means it is significantly more critical to match the supply of these courses to demand as closely as possible. Errors in such matching will take longer and be more expensive to correct than is the case for shorter, cheaper non-affiliated courses. In the longer term, the objective should be to incorporate privately provided non-affiliated courses into the TVET data system using the same data model standards as are used for the affiliated courses.

In addition to the supply of skills from the TVET sector, the other key sources of skills and qualifications are:

- net inflows to the labour force
- net inflows from overseas
- on the job training

These three types of the supply data are discussed in more detail immediately below and proposed approaches for data collection appear in Section 3.3.2.

#### **3.3.2.2 Net domestic inflows to the labour force**

Within any given period some individuals will leave the workforce because of retirement, injury, sickness and death and some individuals will enter or re-enter the workforce. The flow of these individuals into and out of the workforce in association with the skills and qualifications they hold represents another influence on the supply of skills and qualifications in the workforce. The BBS LFS provides data on labour force participation rate, age distribution of the workforce and also the 1-digit industry composition and level of educational attainment. These data can be used to project broad trends in skill and qualifications. More detailed industry based data will need to be developed to provide more accurate accounting in this area. This is further considered in our discussion of industry specific survey functions for the ISC's in Section 3.5.12.2.

#### **3.3.2.3 Net inflows to the labour force from overseas**

BMET maintains quite detailed records of the skills and qualifications of departing Bangladeshi workers. Returning workers, however, appear not to be surveyed for skills and qualifications. We recommend that BMET adopts the NTVQF standard and supplement that with information about industry specific skills for both departing and returning workers. This will make the task of calculating the net change in the supply of skills and qualifications due to overseas worker movements relatively simply to calculate.

#### **3.3.2.4 On the job training**

On the job training is an important source of skills creation. This training occurs outside the TVET system and so is not part of the TVET data system. There is potential, however, to collect data on some aspects of on the job training as part of the ISC industry-specific data survey functions.

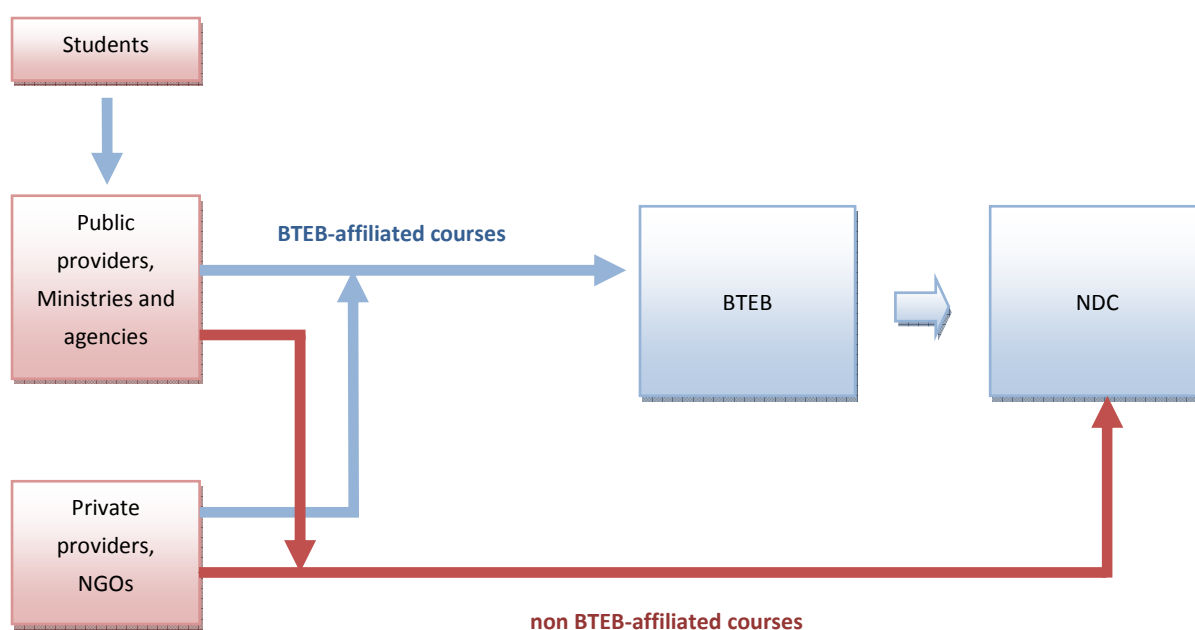
## 3.4 Outputs of TVET sector

### 3.4.1 Data collection process

Data for BTEB-affiliated courses should be passed to the NDC as soon as it is finalised within BTEB. This collection could occur at the beginning of each year after courses are completed on a calendar year basis.

It is recommended that the NDC be empowered to require all agencies under ministries that deliver TVET courses to provide that data to the NDC in the most detailed form available. This, of course can be achieved without legislative change and simply by high-level government directive. If data from agencies can be provided in student unit record form it will be necessary to reformat the data into a form that is consistent with the proposed data model. Where student unit record data is not available from agencies then data should be provided in aggregated form according to NDC's published standards. In general, standards for agency data collection and reporting should follow NDC recommendations and be based on NTVQF.

Figure 1: Administrative data collection process



BTEB currently collects data directly from students via optical character recognition (OCR) forms (see Appendix 1). These forms are countersigned by the institution in which the students enrolled.

In addition to student data it is also necessary to collect data on courses, institutions and the recommended data formats are described below in Section 3.4.3.

### 3.4.2 Who would use this data and for what purpose?

Table 5 shows the key users of administrative data and the types of decisions that relate to this data. It is important to point out that different users will have different needs that can be met from a single data source. It is likely, however, that different users will

require a particular dataset to be presented in different ways. This is a reason for preferring to manage data in detailed unit record form. For any given relatively complex dataset, an open ended number of presentation outputs are possible that meet the varying needs of different users. These presentation formats, which will usually be some form of cross tabulation of the underlying dataset, can be produced automatically from the underlying database using preconfigured data queries.

At this point we re-emphasise that **the significant majority of stakeholders interviewed in the field phase found it difficult to articulate specific decisions that would be facilitated by specific datasets**. For this reason the description of decisions in Table 5 is based in the most part on a literature review and discussions with ILO as well as stakeholder responses.

**Table 5: Administrative data: users and decisions**

| Users             | Decisions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Employers</b>  | Employers' primary concern with respect to the TVET sector is to know whether they can attract sufficient employees with the appropriate skills. This influences decisions about new investment and potential increases in production levels. Specific questions to be addressed include: <ul style="list-style-type: none"> <li>• Which training institutions currently offer programs for our industry?</li> <li>• How many new graduates will they supply in a year?</li> <li>• How can I obtain the numbers of particular skills and qualifications that I need?</li> <li>• How can I ensure that graduate have the skills I require?</li> <li>• Can I collaborate with local providers to increase the number and quality of their graduates, to better match my needs?</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Students</b>   | Students need to make decisions about what courses to take and where to take them. The administrative data of institutions, appropriately presented, is a useful source of data for students about what particular institutions do. Specific questions to be addressed include: <ul style="list-style-type: none"> <li>• What providers offer the course I am interested in?</li> <li>• How many others will be/have been doing the same or similar qualification?</li> <li>• How many who enrol go on to complete the course?</li> <li>• How qualified are the teachers?</li> <li>• What are the class sizes etc?</li> <li>• What sort of jobs do the graduates get and how long does it take them to find a job?</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Government</b> | Government education administrators need institutional administrative data to assess whether institutions are meeting their obligations in respect of funding. Government policymakers require administrative data to make informed judgements about the performance of the TVET sector as a whole and to help them form new policy directions. Administrative data is the primary source for historical information on the supply of skills from the TVET system. <p>In particular, government policy makers need to be able to assess the extent to which skill targets are being met and form responses accordingly if they are not.</p> <p>Policy makers also need to be able to judge the outputs of particular institutions relative to their inputs to make judgements about the efficiency of the administration of particular institutions and the system as a whole. Specific examples of issues to be addressed include:</p> <ul style="list-style-type: none"> <li>• How many potential new workers will be available at a point in time with a particular set of skills, in each region?</li> <li>• Does the skill and geographic pattern of supply of graduates match well with what is known about demand?</li> <li>• What is the drop out rate from courses?</li> <li>• How well qualified are the teachers?</li> <li>• What is the cost per graduate of courses of given length/complexity?</li> <li>• Are some TVET providers giving better value for money than others?</li> <li>• How well do graduates perform in the labour market once qualified?</li> </ul> |

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>TVET institutions</b> | <p>TVET institutions have an interest in their own administrative data for internal administrative purposes and in any case they already have access to such data. They also have an interest in the administrative data of other institutions as a guide to broad trends in skills markets and as a guide to the performance of other TVET institutions. Some examples of questions that TVET institutions might ask include:</p> <ul style="list-style-type: none"> <li>• What is the throughput of a particular set of skills from other providers in my region?</li> <li>• Are the pass and dropout rates for other TVET institutions similar to mine, higher or lower?</li> <li>• What is the cost per graduate in comparable courses, in other institutions?</li> <li>• Where do their teaching staff come from and how well qualified are they?</li> <li>• What co-operative arrangements with local employers and ISCs do other institutions have?</li> </ul> |
| <b>ISCs</b>              | <p>Administrative data of relevance to their particular industries is of key importance to ISCs. It is critical information for developing a picture of the supply of skills and the identification of particular skill gaps. Some examples of relevant questions include:</p> <ul style="list-style-type: none"> <li>• What is the output of a particular skill group from the TVET sector this year for our industry?</li> <li>• Can we increase the output of this skill group by decreasing dropout and failure rates?</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Researchers</b>       | <p>This is a relatively specialist group but it is included because of the importance (as discussed in the literature survey) of maintaining an ongoing research effort in the TVET sector. It is critical to emphasise that the types of questions that can even be asked, let alone answered, will change over time as data improves and as new forms of analysis become possible. In addition, the inherently dynamic nature of labour markets and skills require that ongoing effort is dedicated to understanding these dynamics.</p>                                                                                                                                                                                                                                                                                                                                                                                                                            |

### 3.4.3 Data to be collected

In this section we provide a series of tables containing variable names which cover the recommended set of administrative data for TVET providers.

Data is recommended for six categories of data in six file types:

- Training Provider File
- Client (student) File
- Curriculum File
- Subject File
- Enrolment File
- Qualification Completed File

This recommended dataset draws on the Australian AVETMISS standard.

For each data set:

- a file name is proposed, for example, NDC010
- the coverage of the data set is defined, for example, 'for each Public and Private Training Provider'
- the variable names are listed
- comments on current collection of these variables are provided
- general comments are provided on particular proposed variables
- general comments on the dataset are provided where required.

Note, the proposed filenames have been given the prefix 'NDC' implying that the NSDC Data Cell will be the 'owner' of these datasets.

### 3.4.3.1 Training Provider File (NDC010)

#### Definition

The Training Provider (NDC010) File contains a record for each Public and Private Training Provider that offers an affiliated programme,

This file can grow over time to include:

- Private Training Providers that only offer non affiliated programmes
- other organisations that only offer non affiliated programmes training including individual employers, NGOs,

This file is submitted by each Training Provider that forwards enrolment or qualifications data to BTEB.

BTEB provides a unique number to each Public or Private Training Provider or other organisation.

#### Context

The Training Provider File (NDC010) provides information used to monitor client participation patterns.

**Table 6: Training Provider File**

| Training Provider File (NDC010) Field table |                                |                             |                 |                                                                                                                                          |
|---------------------------------------------|--------------------------------|-----------------------------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Field number                                | Fields                         | Currently Collected by BTEB | Variable        | Comment                                                                                                                                  |
| NDC010-01                                   | Training Provider Identifier   | Y (Part)                    | Up to 10 digits | A unique number can be developed by BTEB so that a Provider's history can be collected over time                                         |
| NDC010-02                                   | Principal Title                | U                           | 4 characters    |                                                                                                                                          |
| NDC010-03                                   | Principal First Given Name     | Y                           | 20 characters   | The variable length should be adjusted to accommodate the longest typical Bangladeshi name                                               |
| NDC010-04                                   | Principal Last Name            | Y                           | 30 characters   | The variable length should be adjusted to accommodate the longest typical Bangladeshi name<br>A name can be scrambled to protect privacy |
| NDC010-10                                   | Permanent Address First Line   | Y                           | 100 characters  | The variable length should be adjusted to accommodate the longest typical Bangladeshi Address [First Line]                               |
| NDC010-11                                   | Permanent Address Post Office  | Y                           | 100 characters  | The variable length should be adjusted to accommodate the longest typical Bangladeshi PO Address                                         |
| NDC010-12                                   | Permanent Address Sub District | Y                           | 30 characters   | The variable length should be adjusted to accommodate the longest typical Bangladeshi Sub District Address                               |

| Training Provider File (NDC010) Field table |                                                                                                                                               |                             |                     |                                                                                                                                          |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Field number                                | Fields                                                                                                                                        | Currently Collected by BTEB | Variable            | Comment                                                                                                                                  |
| NDC010-13                                   | Permanent Address District                                                                                                                    | Y                           | 30 characters       | The variable length should be adjusted to accommodate the longest typical Bangladeshi District Address                                   |
| NDC010-20                                   | Provider Type                                                                                                                                 | Y                           | 2 digits [PU,PR,NG] | public, private, NGO                                                                                                                     |
| NDC010-21                                   | Number of employees by type (teachers, support staff, assistants, etc, in head counts and FTEs; qualifications of teachers                    | U                           | 3 digits            | Additional fields to be further developed as required to describe staff types                                                            |
| NDC010-30                                   | Number of students enrolled last year across all courses                                                                                      | N                           | 6 digits            |                                                                                                                                          |
| NDC010-31                                   | Number of students graduating last year across all courses                                                                                    | N                           | 6 digits            |                                                                                                                                          |
| NDC010-32                                   | Maximum capacity for numbers of students enrolled last year across all courses at current level of use of building and capital (single shift) | N                           | 6 digits            |                                                                                                                                          |
| NDC010-33                                   | Maximum capacity for numbers of students enrolled last year across all courses at current level of use of building and capital (double shift) | N                           | 6 digits            |                                                                                                                                          |
| NDC010-40                                   | Total floor space for teaching rooms                                                                                                          | N                           | 8 digits            | In square metres                                                                                                                         |
| NDC010-41                                   | Total floor space for workshops                                                                                                               | N                           | 8 digits            | In square metres                                                                                                                         |
| NDC010-42                                   | Average age of buildings                                                                                                                      | N                           | 3 digits            | In years                                                                                                                                 |
| NDC010-43                                   | Land area of campus site                                                                                                                      | N                           | 8 digits            | In square metres                                                                                                                         |
| NDC010-50                                   | Total accounting value of builds and other capital assets on campus site                                                                      | N                           | 8 digits            | The variable length should be adjusted to accommodate the longest typical Bangladeshi District Address                                   |
| NDC010-60                                   | Contact for Training Provider                                                                                                                 | Y                           | 50 characters       | First and Last name separated by a space<br>The variable length should be adjusted to accommodate the longest typical Bangladeshi number |
| NDC010-61                                   | Contact Telephone Number - Work                                                                                                               | U                           | 20 characters       | The variable length should be adjusted to accommodate the longest typical Bangladeshi number For student outcome survey                  |
| NDC010-62                                   | Contact Telephone Number - Mobile                                                                                                             | U                           | 20 characters       | The variable length should be adjusted to accommodate the longest typical Bangladeshi number For student outcome survey                  |
| NDC010-63                                   | Contact Email address                                                                                                                         | U                           | 80 characters       | The variable length should be adjusted to accommodate the longest typical Bangladeshi email name For student outcome survey              |

Legend Y – Currently collected by BTEB; N – Not currently collected; U - Uncertain  
Field numbering convention allows up to 100 fields per File and for future growth

### 3.4.3.2 Client File (NDC020)

#### Definition

The Client (NDC020) File contains a record for each client:

- who has participated in VET activity,
- including sitting for an assessment or
- who has been awarded a qualification during the collection period
- or is still studying in the collection period.

A client is someone who is engaged in BTEB affiliated training activity or has completed a BTEB qualification in the public or private sector. This file is submitted by each Training Provider (or college) that forwards enrolment or qualifications data to BTEB.

#### Context

The Client File (NDC020) provides information used to monitor client participation patterns.

**Table 7: Client File**

| Client File (NDC020) Field table |                                |                             |                |                                                                                                                                          |
|----------------------------------|--------------------------------|-----------------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Field number                     | Fields                         | Currently Collected by BTEB | Variable       | Comment                                                                                                                                  |
| NDC020-01                        | Client Identifier              | N                           | 10 digits      | A unique number can be developed by BTEB so that all of a client's history can be collected over time                                    |
| NDC020-02                        | Client Title                   | U                           | 4 characters   |                                                                                                                                          |
| NDC020-03                        | Client First Given Name        | Y                           | 20 characters  | The variable length should be adjusted to accommodate the longest typical Bangladeshi name                                               |
| NDC020-04                        | Client Last Name               | Y                           | 30 characters  | The variable length should be adjusted to accommodate the longest typical Bangladeshi name<br>A name can be scrambled to protect privacy |
| NDC020-10                        | Permanent Address First Line   | Y                           | 100 characters | The variable length should be adjusted to accommodate the longest typical Bangladeshi Address [First Line]                               |
| NDC020-11                        | Permanent Address Post Office  | Y                           | 100 characters | The variable length should be adjusted to accommodate the longest typical Bangladeshi PO Address                                         |
| NDC020-12                        | Permanent Address Sub District | Y                           | 30 characters  | The variable length should be adjusted to accommodate the longest typical Bangladeshi Sub District Address                               |
| NDC020-13                        | Permanent Address District     | Y                           | 30 characters  | The variable length should be adjusted to accommodate the longest typical Bangladeshi District Address                                   |
| NDC020-20                        | Date of Birth                  | Y                           | DD/MM/YYYY     |                                                                                                                                          |
| NDC020-21                        | Sex                            | U                           | M/F            |                                                                                                                                          |
| NDC020-22                        | Labour Force Status Identifier | U                           | 2 digits       | May include:<br>Full-time employee 01<br>Part-time employee 02                                                                           |

| Client File (NDC020) Field table |                                     |                             |               |                                                                                                                                                                                                                                            |
|----------------------------------|-------------------------------------|-----------------------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Field number                     | Fields                              | Currently Collected by BTEB | Variable      | Comment                                                                                                                                                                                                                                    |
|                                  |                                     |                             |               | Self employed - not employing others 03<br>Employer 04<br>Employed - unpaid worker in a family business 05<br>Unemployed - seeking full-time work 06<br>Unemployed - seeking part-time work 07<br>Not employed - not seeking employment 08 |
| NDC020-23                        | Father's Name                       | Y                           | 50 characters | First and Last name separated by a space<br>The variable length should be adjusted to accommodate the longest typical Bangladeshi name                                                                                                     |
| NDC020-24                        | Equity and Access indicators        | N?                          |               | To be developed by BTEB as required                                                                                                                                                                                                        |
| NDC020-25                        | Mother's Name                       | Y                           | 50 characters | First and Last name separated by a space<br>The variable length should be adjusted to accommodate the longest typical Bangladeshi name                                                                                                     |
| NDC020-30                        | Telephone Number - Home             | U                           | 20 characters | The variable length should be adjusted to accommodate the longest typical Bangladeshi number. For student outcome survey.                                                                                                                  |
| NDC020-31                        | Telephone Number - Mobile           | U                           | 20 characters | The variable length should be adjusted to accommodate the longest typical Bangladeshi number. For student outcome survey                                                                                                                   |
| NDC020-32                        | Email address                       | U                           | 20 characters | The variable length should be adjusted to accommodate the longest typical Bangladeshi email name For student outcome survey                                                                                                                |
| NDC020-40                        | Highest School Level Completed      | U                           | 2 digits      | Useful for research to identify educational level of student                                                                                                                                                                               |
| NDC020-41                        | Year Highest School Level Completed | U                           | 2 digits      | Useful for research to identify when obtained                                                                                                                                                                                              |
| NDC020-42                        | Prior Educational Achievement       | U                           | 2 digits      | Should include the relevant Education Framework level identifier Useful for research to identify other qualifications achieved                                                                                                             |
| NDC020-43                        | Occupational background of client   | N?                          | 4 or 6 digit  | BSCO identifier as agreed by industry<br>Useful for research to identify if client is seeking to change occupations or obtain more skills for a current occupation                                                                         |

Legend Y – Currently collected by BTEB; N – Not currently collected; U - Uncertain

### 3.4.3.3 Curriculum File (NDC030)

#### Definition

The Curriculum (NDC030) File contains a record for each curriculum, associated qualification, NVTQF programme or speciality course associated with enrolment activity and completed qualifications during the collection period.

A qualification or course is a structured program of study that may or may not include industrial attachment.

#### Context

The Curriculum (NAT030) File provides information about the affiliated curriculum or qualifications or course offered by public and private Training Provider to assist with analysis of the type and level of training provided in Bangladesh. In time, non affiliated training may also be collected from Training Providers using this file structure.

This file is submitted by each Training Provider (or college) that forwards enrolment or qualifications data to BTEB.

BTEB or BBS may verify:

- that the Training Provider (or college) is authorised to deliver the affiliated courses specified.
- or help the Training Provider (or college) to classify non-affiliated courses to a level of education, field of education and BSCO occupation that the curriculum is designed.
- and develop and apply a unique Curriculum qualification or NVTQF programme Identifier

**Table 8: Curriculum File**

| Curriculum File (NDC030) Field table |                                                           |                             |                                |                                                                                                                                                                                                                                                        |
|--------------------------------------|-----------------------------------------------------------|-----------------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Field number                         | Fields                                                    | Currently Collected by BTEB | Variable                       | Comment                                                                                                                                                                                                                                                |
| NDC030-01                            | Curriculum qualification or NVTQF programme Identifier    | Y                           | Up to 10 characters or digits  | A unique number for each affiliated course curriculum program<br>Versioning can also be accommodated through the use of numbers or characters.<br>Allows for future growth of non affiliated courses. In this case a unique course id for each course. |
| NDC030-02                            | Curriculum qualification or NVTQF programme Name          | Y                           | Up to 100 characters or digits |                                                                                                                                                                                                                                                        |
| NDC030-03                            | Curriculum qualification or NVTQF programme Nominal Hours | U                           | 4 digits                       | The average number of hours required to complete the course                                                                                                                                                                                            |

| Curriculum File (NDC030) Field table |                                                                           |                             |                |                                                                                                                                                                                                                                                                           |
|--------------------------------------|---------------------------------------------------------------------------|-----------------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Field number                         | Fields                                                                    | Currently Collected by BTEB | Variable       | Comment                                                                                                                                                                                                                                                                   |
| NDC030-04                            | Curriculum qualification or NVTQF programme Recognition Identifier        | Y                           | Y/N            | Allows BTEB Affiliated course programs to be identified (Y)<br>Allows for the future growth of non Affiliated courses in the collection (N)<br>i.e. BTEB Affiliated = Y; Non-BTEB Affiliated = N)                                                                         |
| NDC030-05                            | Curriculum qualification or NVTQF programme Level of Education Identifier | Y                           | 1 digit        | 1 – 6 or more as required<br>Allows training that is part of the NVTQF to be classified according to the level of academic or practical rigor. This would be especially useful to help compare non NVTQF courses to NVTQF courses. ISC' should be charged with this task. |
| NDC030-10                            | Is the training 'on the job'                                              | N                           | 1 character    | (Y, N, or mixed)                                                                                                                                                                                                                                                          |
| NDC010-11                            | Curriculum qualification or NVTQF programme Field of Education Identifier | Y                           | Up to 8 digits | A Field of Education (or Study) can help classify the training that can be linked to ISCED (ISCED?)                                                                                                                                                                       |
| NDC010-12                            | BSCO Identifier (1)                                                       | N                           | Up to 6 digit  | The occupation that this training addresses. BSCO will help link supply and demand.                                                                                                                                                                                       |
| NDC010-13                            | BSCO Identifier (2)                                                       | N                           | Up to 6 digit  | A second occupation that this training may also address                                                                                                                                                                                                                   |
| NDC010-20                            | BSCO Identifier (3)                                                       | N                           | Up to 6 digit  | A third occupation that this training may also address.                                                                                                                                                                                                                   |

Legend Y – Currently collected by BTEB; N – Not currently collected; U - Uncertain

Where a second or subsequent BSCO is applied to a course then it would be useful to determine the relative percentage of students in each occupation. However depending on the need this percentage may change over time and the ISC will need to keep this list under review.

The BSCO is the link between training supply and demand. The method proposed in the above table links curriculum to occupation (and vice versa).

The BSCO is the link between overseas supply and demand. Supply in the occupation(s) an individual has skills for can be linked to an occupation (and vice versa). This could be ascertained via immigration smart cards inwards (and outwards) or through visa applications.

On the demand side it should be the role of ISCs and/or BBS to determine this demand for their respective industries.

In the middle to longer term, the BBS should update occupations into an ISCO format by drilling down further or specifically specifying those occupations of key importance to Bangladesh and where they map to in the new ISCO.

### 3.4.3.4 Curriculum Enrolment File (NDC040)

#### Definition

The Curriculum Enrolment File (NDC040) contains a record for each Curriculum File (NDC030) course for a client at a Training Provider during the collection period.

#### Context

The Curriculum Enrolment File (NDC040) provides information about training activity undertaken by clients during the collection period. This information is used to measure training activity and output for the sector.

**Table 9: Curriculum Enrolment File**

| Curriculum Enrolment File (NDC040) Field table |                                                        |                             |                               |                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------------------------------|--------------------------------------------------------|-----------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Field number                                   | Fields                                                 | Currently Collected by BTEB | Variable                      | Comment                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| NDC010-01                                      | Training Provider Identifier                           | Y                           | Up to 10 digits               | Found in the TRAINING PROVIDER FILE (NDC010)                                                                                                                                                                                                                                                                                                                                                                                                 |
| NDC020-01                                      | Client Identifier                                      | N                           | 10 digits                     | Found in the CLIENT FILE (NDC020) FIELD TABLE                                                                                                                                                                                                                                                                                                                                                                                                |
| NDC030-01                                      | Curriculum qualification or NVTQF programme Identifier | Y                           | Up to 10 characters or digits | Found in the CURRICULUM FILE (NDC030)                                                                                                                                                                                                                                                                                                                                                                                                        |
| NDC040-04                                      | Enrolment Activity Start Date                          | N                           | DD/MM/YYYY                    | For the full course                                                                                                                                                                                                                                                                                                                                                                                                                          |
| NDC040-05                                      | Enrolment Activity End Date                            | N                           | DD/MM/YYYY                    | For the full course. Where the student is still training [Outcome 'S' below] it is the expected End Date of the course being studied                                                                                                                                                                                                                                                                                                         |
| NDC040-10                                      | Outcome Identifier                                     | N                           | S/P/F/W/D                     | Provides information about whether the client is still training, has passed, failed, withdrawn or deferred training for the whole Curriculum qualification or NVTQF programme. Students with an 'S' result give an insight into the numbers of students expected to be available in the future. In the case of an 'S' outcome the provider must report a final outcome in the next or a subsequent collection                                |
| NDC040-11                                      | Study Reason Identifier                                | N                           | 2 digits                      | This field can provide information about what the student hopes to achieve as a result of doing the training and could include:<br>To get a job 01<br>To develop my existing business 02<br>To start my own business 03<br>To try for a different career 04<br>To get a better job or promotion 05<br>It was a requirement of my job 06<br>I wanted extra skills for my job 07<br>To get into another course of study 08<br>Other reasons 11 |
| NDC040-12                                      | Client Tuition Fee                                     | N                           | 6 digits                      | In Taka. This field can provide information about the cost to the student of the Curriculum qualification or NVTQF programme                                                                                                                                                                                                                                                                                                                 |

### 3.4.3.5 Subject File (NDC060) - Optional

#### Definition

The Subject File (NDC060) contains a record for each unit or subject associated with enrolment activity in a course or curriculum during the collection period. If desired by BTEB, this file allows a deeper analysis of the individual components of the Curriculum (NDC030) File.

The unit or subject could be studied independently but is usually offered as part of an affiliated curriculum. At a later time each unit or subject associated with enrolment activity in a non affiliated course or curriculum could be added

#### Context

The Subject File (NDC060) provides information about units or subjects that are undertaken and/or completed by clients during the collection period. Each subject is normally part of a course or qualification.

**Table 10: Subject File**

| Subject File (NDC060) Field table |                                                         |                                    |                                |                                                                                                                                                                                                                                                                        |
|-----------------------------------|---------------------------------------------------------|------------------------------------|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Field number                      | Fields                                                  | Currently Collected by BTEB        | Variable                       | Comments                                                                                                                                                                                                                                                               |
| NDC060-01                         | Subject Identifier                                      | Up to 10 characters or digits<br>N | 1                              | A unique number for each affiliated curriculum subject<br>Versioning can also be accommodated through the use of numbers or characters.<br>Allows for future growth of non affiliated courses. In this case a unique course id for each course.                        |
| NDC060-02                         | Subject Name                                            | N                                  | Up to 100 characters or digits |                                                                                                                                                                                                                                                                        |
| NDC060-03                         | Subject Recognition Identifier                          | Y                                  | Y/N                            | Allows BTEB Affiliated course subjects to be identified (Y)<br>Allows for the future growth of non Affiliated courses in the collection (N) ie (BTEB Affiliated = Y; Non-BTEB Affiliated = N)                                                                          |
| NDC060-04                         | Subject Field of Education Identifier                   | N                                  | Up to 6 digits                 | 1 – 6 or more as required Allows training that is part of the NVTQF to be classified according to the level of academic or practical rigor. This would be especially useful to help compare non NVTQF courses to NVTQF courses. ISC' should be charged with this task. |
| NDC060-05                         | Subject Nominal Hours                                   | N                                  | 3 digits                       | Average hours taken by a student to complete the subject                                                                                                                                                                                                               |
| *NDC030-01                        | *Curriculum qualification or NVTQF programme Identifier | Y                                  | Up to 10 characters or digits  | The curriculum or course that this subject is part of. This is drawn from the NDC030 file                                                                                                                                                                              |

Legend Y – Currently collected by BTEB; N – Not currently collected; U - Uncertain  
Field numbering convention allows up to 100 fields per File and for future growth

\*There may be the same subject (with the same identifier) in this file that is attached to different courses. In this case a (unique) Curriculum identifier in the NDC030 file will also need to be included in this file to determine the associated course. Alternatively the associated Curriculum can be determined through each student enrolment in the Subject Enrolment File (NDC070). .

**Table 11: Subject File (optional inclusions)**

| Subject Enrolment File (NDC070) Field table |                                                        |                             |                               |                                                                                                                                                                                                                                                            |
|---------------------------------------------|--------------------------------------------------------|-----------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Field number                                | Fields                                                 | Currently Collected by BTEB | Variable                      | Comment                                                                                                                                                                                                                                                    |
| NDC010-01                                   | Training Provider Identifier                           | Y                           | Up to 10 digits               | Found in the TRAINING PROVIDER FILE (NDC010)                                                                                                                                                                                                               |
| NDC020-01                                   | Client Identifier                                      | N                           | 10 digits                     | Found in the CLIENT FILE (NDC020) FIELD TABLE                                                                                                                                                                                                              |
| NDC030-01                                   | Curriculum qualification or NVTQF programme Identifier | Y                           | Up to 10 characters or digits | Found in the CURRICULUM FILE (NDC030)                                                                                                                                                                                                                      |
| NDC060-01                                   | Subject Identifier                                     | N                           | Up to 10 characters or digits | A unique number for each affiliated curriculum subject<br>Versioning can also be accommodated through the use of numbers or characters.<br>Allows for future growth of non affiliated courses. In this case a unique course id for each course.            |
| NDC070-04                                   | Subject Enrolment Activity Start Date                  | N                           | DD/MM/YYYY                    |                                                                                                                                                                                                                                                            |
| NDC070-05                                   | Subject Enrolment Activity End Date                    | N                           | DD/MM/YYYY                    | Where the student is still training [Outcome 'S' below]it is the expected End Date of the course being studied                                                                                                                                             |
| NDC070-10                                   | Subject Outcome Identifier                             | N                           | S/P/F/W/D                     | Provides information about whether the client is still training, has passed, failed, withdrawn or deferred training for the subject. In the case of an 'S' outcome the provider must report a final subject outcome in the next or a subsequent collection |

Legend Y – Currently collected by BTEB; N – Not currently collected; U - Uncertain

Note the Curriculum that the subject is part of is determined through the Subject File (NDC060). This is because the same subject may be used by a number of different courses.

### 3.4.4 Data presentation

There are a number of drivers determining how TVET administrative data should be presented. There are several user groups of the data and the types of data and the appropriateness of various presentation formats will depend largely on the types of users and their reasons for accessing the data. For example:

- students are likely to require a relatively high level information in a summary and user-friendly form that enables them to determine what courses are given at various institutions, how many students take the courses relevant to them, the cost and time requirements and amount of workplace training, the proportion of students who graduate and the employment outcomes of graduates
- employers want to know the output of graduates on a national and regional basis and want relatively fine-grained information about type of course
- government administrators need aggregated and summary forms of data that meet their requirements for management of providers and to satisfy reporting requirements to their ministries
- policymakers and researchers require the most flexible data and the presentation formats for these users should not be prescribed because they will need to make use of the most detailed data available including unit student records for customised analysis and presentation.

Given this diversity of users and the number of data types specified above there are hundreds of potentially useful cross-tabulations that could be provided in the form of tables in order to present the data for different types of users with different needs. It should be one of the objectives of a centralised and well-managed dataset that a large number of presentation outputs can be produced including customised cross-tabulations for specialist requirements. Also, as the data collected over time forms time series, it will be possible to execute a variety of statistical analysis to create better understanding of the dynamics of supply side characteristics, for example, the changing gender composition of various types of course.

Therefore, we recommend not highly specifying the various possible presentation formats at this stage but rather focusing on the underlying data structures and processes that will produce highly versatile and useful datasets in the longer term. To provide readers with some idea of possible presentation formats, the tables overleaf presenting administrative data from NCVER are provided for illustrative purposes rather than recommended specifically for Bangladesh.

**Table 12 Students by major courses and qualifications, 2004–08**

|                                                | 2004<br>(’000) | 2005<br>(’000) | 2006<br>(’000) | 2007<br>(’000) | 2008<br>(’000) | %            | 2007–08<br>%<br>change |
|------------------------------------------------|----------------|----------------|----------------|----------------|----------------|--------------|------------------------|
| <b>AQF qualifications</b>                      |                |                |                |                |                |              |                        |
| Diploma or higher                              | 176.0          | 173.1          | 167.7          | 166.0          | 171.2          | 10.1         | 3.1                    |
| Certificate IV                                 | 189.6          | 179.1          | 177.6          | 188.7          | 189.2          | 11.2         | 0.3                    |
| Certificate III                                | 408.1          | 437.7          | 463.5          | 476.8          | 519.2          | 30.6         | 8.9                    |
| Certificate II                                 | 249.3          | 249.3          | 292.6          | 281.6          | 286.4          | 16.9         | 1.7                    |
| Certificate I                                  | 85.2           | 96.7           | 98.3           | 100.1          | 91.4           | 5.4          | -8.7                   |
| <i>AQF sub-total</i>                           | <i>1108.2</i>  | <i>1135.9</i>  | <i>1199.7</i>  | <i>1213.1</i>  | <i>1257.5</i>  | <i>74.1</i>  | <i>3.7</i>             |
| <b>Non-AQF qualifications</b>                  |                |                |                |                |                |              |                        |
| Other recognised courses                       | 294.4          | 277.5          | 279.9          | 251.1          | 228.7          | 13.5         | -8.9                   |
| Non-award courses                              | 128.3          | 94.7           | 90.7           | 87.4           | 94.9           | 5.6          | 8.6                    |
| Subject only—no qualification                  | 75.4           | 142.7          | 105.6          | 113.4          | 115.4          | 6.8          | 1.8                    |
| <i>Non-AQF sub-total</i>                       | <i>498.2</i>   | <i>514.9</i>   | <i>476.2</i>   | <i>451.9</i>   | <i>439.0</i>   | <i>25.9</i>  | <i>-2.9</i>            |
| <b>Field of education</b>                      |                |                |                |                |                |              |                        |
| Natural and physical sciences                  | 6.3            | 5.7            | 5.5            | 5.9            | 6.0            | 0.4          | 2.2                    |
| Information technology                         | 62.3           | 57.9           | 57.0           | 36.6           | 32.9           | 1.9          | -10.1                  |
| Engineering and related technologies           | 258.3          | 263.5          | 284.8          | 278.8          | 282.4          | 16.6         | 1.3                    |
| Architecture and building                      | 101.7          | 104.4          | 112.0          | 111.9          | 120.2          | 7.1          | 7.4                    |
| Agriculture, environmental and related studies | 79.5           | 81.0           | 77.4           | 70.6           | 67.7           | 4.0          | -4.0                   |
| Health                                         | 81.3           | 78.0           | 80.2           | 85.2           | 80.3           | 4.7          | -5.7                   |
| Education                                      | 51.0           | 47.8           | 46.7           | 51.5           | 49.6           | 2.9          | -3.6                   |
| Management and commerce                        | 332.4          | 316.1          | 324.5          | 337.9          | 345.3          | 20.4         | 2.2                    |
| Society and culture                            | 163.9          | 163.3          | 170.6          | 161.9          | 176.7          | 10.4         | 9.1                    |
| Creative arts                                  | 48.5           | 44.2           | 44.4           | 44.1           | 43.6           | 2.6          | -1.0                   |
| Food, hospitality and personal services        | 153.1          | 151.9          | 166.5          | 169.2          | 181.8          | 10.7         | 7.4                    |
| Mixed field programs                           | 192.6          | 194.2          | 200.8          | 198.0          | 194.5          | 11.5         | -1.8                   |
| Subject only—no field of education             | 75.4           | 142.7          | 105.6          | 113.4          | 115.4          | 6.8          | 1.8                    |
| <b>Type of accreditation</b>                   |                |                |                |                |                |              |                        |
| National training package qualifications       | 813.9          | 866.6          | 956.2          | 985.7          | 1055.8         | 62.2         | 7.1                    |
| Nationally accredited courses                  | 373.3          | 345.7          | 332.5          | 287.6          | 244.9          | 14.4         | -14.8                  |
| Other courses                                  | 343.8          | 295.9          | 281.6          | 278.2          | 280.3          | 16.5         | 0.7                    |
| Subject only—no accreditation                  | 75.4           | 142.7          | 105.6          | 113.4          | 115.4          | 6.8          | 1.8                    |
| <b>Total students</b>                          | <b>1606.4</b>  | <b>1650.8</b>  | <b>1676.0</b>  | <b>1665.0</b>  | <b>1696.4</b>  | <b>100.0</b> | <b>1.9</b>             |

Source: Australian vocational education and training statistics Students and courses, 2008, NCVER, p9

**Table 13 Major funding of VET training by provider type profile, 2004 –089**

|                                                      | 20041         | 2005          | 20062         | 2007          | 20084                                   |             | 2007–08     |
|------------------------------------------------------|---------------|---------------|---------------|---------------|-----------------------------------------|-------------|-------------|
|                                                      | ('000)        | ('000)        | ('000)        | ('000)        | ('000)                                  | %           | % change    |
| <b>Number of students</b>                            |               |               |               |               |                                         |             |             |
| <b>TAFE and other government providers</b>           |               |               |               |               |                                         |             |             |
| Commonwealth and state funding                       | 859.2         | 880.1         | 936.3         | 927.8         | 914.7                                   | 53.9        | -1.4        |
| Domestic full-fee paying                             | 388.0         | 365.7         | 364.2         | 350.8         | 371.9                                   | 21.9        | 6.0         |
| International full-fee paying                        | 21.1          | 21.4          | 24.6          | 34.3          | 39.2                                    | 2.3         | 14.6        |
| <i>Sub-total TAFE and other government providers</i> | <i>1268.3</i> | <i>1267.2</i> | <i>1325.1</i> | <i>1312.8</i> | <i>1325.8</i>                           | <i>78.2</i> | <i>1.0</i>  |
| <b>Community education providers</b>                 |               |               |               |               |                                         |             |             |
| Commonwealth and state funding                       | 137.5         | 152.8         | 126.7         | 128.9         | 124.0                                   | 7.3         | -3.8        |
| Domestic full-fee paying                             | 33.9          | 46.8          | 38.9          | 35.7          | 32.3                                    | 1.9         | -9.5        |
| International full-fee paying                        | 0.1           | 0.1           | 0.1           | 0.1           | 0.0                                     | 0.0         | -78.6       |
| <i>Sub-total community education providers</i>       | <i>171.4</i>  | <i>199.7</i>  | <i>165.7</i>  | <i>164.7</i>  | <i>156.3</i>                            | <i>9.2</i>  | <i>-5.1</i> |
| <b>Other registered providers</b>                    |               |               |               |               |                                         |             |             |
| Commonwealth and state funding                       | 160.5         | 177.5         | 178.7         | 178.8         | 204.0                                   | 12.0        | 14.1        |
| Domestic full-fee paying                             |               |               |               |               | Not applicable for scope of publication |             |             |
| International full-fee paying                        |               |               |               |               |                                         |             |             |
| <i>Sub-total other registered providers</i>          | <i>160.5</i>  | <i>177.5</i>  | <i>178.7</i>  | <i>178.8</i>  | <i>204.0</i>                            | <i>12.0</i> | <i>14.1</i> |
| Total students                                       | 1606.4        | 1650.8        | 1676.0        | 1665.0        | 1696.4                                  | 100.0       | 1.9         |
|                                                      | ('000 000)    | ('000 000)    | ('000 000)    | ('000 000)    | ('000 000)                              | %           | % change    |
| <b>Number of hours of delivery</b>                   |               |               |               |               |                                         |             |             |
| <b>TAFE and other government providers</b>           |               |               |               |               |                                         |             |             |
| Commonwealth and state funding                       | 249.7         | 257.7         | 262.0         | 271.8         | 274.8                                   | 67.3        | 1.1         |
| Domestic full-fee paying                             | 39.9          | 39.5          | 42.3          | 42.7          | 46.4                                    | 11.4        | 8.9         |
| International full-fee paying                        | 11.6          | 12.4          | 14.1          | 18.7          | 23.1                                    | 5.6         | 23.5        |
| <i>Sub-total TAFE and other government providers</i> | <i>301.2</i>  | <i>309.6</i>  | <i>318.4</i>  | <i>333.1</i>  | <i>344.4</i>                            | <i>84.3</i> | <i>3.4</i>  |
| <b>Community education providers</b>                 |               |               |               |               |                                         |             |             |
| Commonwealth and state funding                       | 10.5          | 12.0          | 12.0          | 14.5          | 14.4                                    | 3.5         | -0.5        |
| Domestic full-fee paying                             | 2.3           | 2.6           | 2.8           | 3.1           | 2.8                                     | 0.7         | -7.4        |
| International full-fee paying                        | 0.0           | 0.0           | 0.1           | 0.0           | 0.0                                     | 0.0         | -67.3       |
| <i>Sub-total community education providers</i>       | <i>12.8</i>   | <i>14.7</i>   | <i>14.8</i>   | <i>17.6</i>   | <i>17.3</i>                             | <i>4.2</i>  | <i>-1.9</i> |
| <b>Other registered providers</b>                    |               |               |               |               |                                         |             |             |
| Commonwealth and state funding                       | 33.1          | 37.7          | 38.9          | 39.3          | 46.9                                    | 11.5        | 19.1        |
| Domestic full-fee paying                             |               |               |               |               | Not applicable for scope of publication |             |             |
| International full-fee paying                        |               |               |               |               |                                         |             |             |
| <i>Sub-total other registered providers</i>          | <i>33.1</i>   | <i>37.7</i>   | <i>38.9</i>   | <i>39.3</i>   | <i>46.9</i>                             | <i>11.5</i> | <i>19.1</i> |
| Total annual hours of delivery                       | 347.1         | 362.0         | 372.1         | 390.1         | 408.5                                   | 100.0       | 4.7         |

Source: Australian vocational education and training statistics Students and courses, 2008, NCVER, p16

## 3.5 Data on industry demand for skills and qualifications

Industry skills demand data is really a generic term that reflects a desire to know about the type of skills and qualifications required by employers. Therefore the 'demand for skills' is a conceptual construct rather than a particular type of dataset that can be objectively defined and therefore collected, such as 'the number of persons in a particular region' or 'the number of students that completed a particular course at a particular TVET provider'. The notion of demand for skills is definitionally elusive and operationally problematic. Pragmatically speaking, it is only ever possible to estimate the demand for skills because, even with unlimited resources, it would never be possible to arrive at measurements that were objectively verifiable as accurate. Given that resources for data collection are limited the focus needs to be on the accuracy of estimates relative to the functions to which they will be put.

Estimating the demand for skills by industry requires a range of interrelated data and inevitably involves approximations and assumptions. In many ways the estimation of industry skills demand is far more challenging than the collection of administrative data from the TVET system. This is partly because of the multiple sources from which this data must be derived and the complexity of skill definitions and their relationship to occupations in the workforce.

### 3.5.1 Conceptual and definitional challenges and responses

There are two challenges associated with forecasting future demand for skills and qualifications: estimating the current level of demand; and the problems associated with projection of that demand.

There is a relatively loose relationship between occupations, skills and qualifications. This is directly pertinent to the estimation of current skills demand. For example, if only 60% of employees in a particular occupational category have the qualification that is defined to be a requirement for that occupation and the demand for that occupation is expected to grow by 10% per year, does this mean we need 10% more graduates with this qualification per year or say only 6% more? Or do we need more than 10% because there is, in effect, a shortage of skills in this particular occupation and because we know that some individuals who obtain the qualification will end up not working in the target occupation? Ultimately, the answer to this question depends on the Government's policy and industries' preferences for changing the existing 'skill and qualifications intensity' of particular occupations. The 'right' answer about the demand for skills does not simply 'fall out of the numbers'.

This problem is related to attempts to use the current levels of employment of particular skills and qualifications as a guide to demand. As we have noted, because 'the short side dominates', if there are existing skills shortages, current employment levels will indicate supply rather than demand and if there are surpluses the opposite is true.

Another approach to estimating the demand for skills and qualifications is to survey employers. There are two problems with this approach: firstly employers have an incentive to exaggerate their demand for skills and qualifications when surveyed in this way; and secondly, employers may not have a clear idea of their forward demand for skills and qualifications.

So while it might be possible to achieve a reasonable approximation of current levels of demand it may not be possible to get meaningful estimates of forward demand.

Additionally, when attempting to project future demand there is irreducible uncertainty about the future – all forecasting methods that are based on distributions of occupations or qualifications or industry structures themselves are subject to error when these distributions change, which is happening constantly. The central assumption is that ‘the future is like the past’ and where change occurs gradually this is a reasonable assumption but when change is rapid, as it is at the turning point of business cycles, or with substantial shifts in international prices, this assumption can lead to significant errors. A recent example is the demand for real estate agents before and after the collapse in US house prices.

Some ways of responding to these demand issues include:

- be cautious about the reliability of quantitative estimates
- where possible collect data by alternative means and/or from other sources as a cross-check or for ‘triangulation’, including from job agencies and from workers
- cross-check and amend data with qualitative input from a range of sources.
- don’t expect to resolve forecasts to the desired level of resolution – this can lead to misleading ‘spurious accuracy’.

Another important consideration, given that information will inevitably be imperfect, is to develop high-level rules about where to focus remedial action and sources when there appears to be a significant skills shortage. Again, it is emphasised that skill shortages are notoriously difficult to define and measure (see Richardson 2009). Instead in general it is more useful to focus skill training resources on situations where:

- the size of the skills shortage is large relative to the total number of employees with similar skills currently working in the industry
- existing output of the TVET sector in that particular skill is small compared with the size of a skill shortage (i.e., where the flow of new skills is small relative to the size of a shortage)
- the training is of relatively long duration and relatively high cost
- the absence of the skill has important consequences for the productivity and employment of other workers, and of capital.
- the skills required are of general use across multiple industries.

These types of high-level rules are a useful supplement to projections of industry specific skill demand.

### 3.5.2 What are the benefits of collecting skills and qualifications demand data?

The benefits of collecting industry demand data are:

- data on the demand of skills from industry are obviously essential for improving the matching of supply and demand through explicit planning processes
- up-to-date and comprehensive data about industry skill needs is essential for informing and strengthening the interactions between industry and the TVET sector and as a basis for effective quantitative planning
- industry skill requirements data is useful for helping prospective students make better training and career choices
- industry skill needs are clearly useful to TVET institutions especially in the context of them having greater autonomy
- consolidated industry skill demand is indispensable for building better knowledge in the long run about skill markets and their dynamics.

### 3.5.3 Who would use this data and what for?

Table 14 shows the users of demand data and the types of decisions that would use this data.

**Table 14: Demand data: users and decisions**

| <b>Users</b>             | <b>Decisions this user may make using demand data</b>                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Employers</b>         | Employers' primary concern is to know whether they can attract sufficient employees with the appropriate skills at an affordable cost. This influences decisions about new investment and increases in production levels. Data about the overall level of demand (and duration of vacancies) in particular industries would help employers make judgements about how difficult it is expected to be to attract particular skills. |
| <b>Students</b>          | Students need to make decisions about what courses to take and where to take them. Appropriately presented, demand data will help students understand which skills are in relatively high demand in each region.                                                                                                                                                                                                                  |
| <b>Government</b>        | Government education administrators need demand data in order to determine target levels of output particularly qualifications from public TVET providers. Government policymakers similarly require demand data as an input for forward policy planning. Government organisations concerned with overseas workers, primarily BMET and MEWOE, need to form an integrated picture of demand from domestic and overseas sources.    |
| <b>TVET institutions</b> | Demand data is a primary input for TVET institutions. In particular, private institutions which have discretion about the number of seats to offer for particular qualifications and will use demand data to guide their forward planning. Public TVET institutions are likely to use demand data in their dialogues with government administrative organisations such as DTE.                                                    |
| <b>ISCs</b>              | ISCs will be both producers and users of industry demand data. Each ISC will have a primary concern to assist in developing estimates and forecasts of industry demand that they will also have an interest in demand from other industries because those industries may use similar skills and qualifications as their own and therefore affect the relevant supply of skills to their primary industry.                         |
| <b>Researchers</b>       | Again, researchers will have the most open ended and unpredictable requirement for data. Assessing the performance of the TVET sector in relation to industry demand can be expected to be a primary research issue of the TVET sector.                                                                                                                                                                                           |

### 3.5.4 Where is existing data?

Data regarding skills in the workforce is available from a number of sources but are generally not in the form required or in sufficient detail for detailed demand supply analysis. Existing sources for relevant datasets include:

- Bangladesh Bureau of Statistics maintains a number of datasets that are relevant to forming a picture of the demand for skills in specific industries, regions and for the Bangladesh economy as a whole:
  - BBS census – the national census is available source of population wide characteristics on educational attainment and occupation
  - BBS labour force survey – a household-based survey which appears to be undertaken every 3 to 4 years and collects information about educational attainment, occupation, industry of employment, average hours worked and earnings. Again, this is useful for population wide summary measures but is not categorised by industry.
  - Ad hoc industry surveys.
- Industry representative bodies and associated government line-Ministries. Some industry representative bodies undertake research on skill needs in their respective industries. For example, recently a needs assessment survey was undertaken on the primary textile and ready made garments industry.<sup>10</sup> This type of study is a very positive sign and is potentially a precursor to the type of activities that could be undertaken by proposed ICSs. However, existing data is partial and collection is ad hoc. This type of activity needs to be consolidated and systematised across a minimum set of priority industries.
- Bangladesh businesses – businesses themselves are the primary source of demand for skills and data from this source could be obtained through survey. However, it needs to be recognised that surveys are expensive and there is a problem of bias to deal with in survey design-- in this case because employers have an incentive to overstate skills demand.
- BMET collects detailed data on skill types for workers as they leave for overseas.

As we have indicated earlier, the data from these sources is of insufficient detail to enable planning for the TVET system and effective demand and supply matching.

### 3.5.5 Approach to improving industry demand data collection

What is fundamentally required to improve the matching of supply and demand for skills and qualifications is significantly more detail about the occupational composition of employment in Bangladesh and a better understanding of the links between skills and qualifications on one hand and occupations on the other.

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<sup>10</sup> Implemented by the United Nations Industrial Development Organization in association with the Ministry of Industries, Ministry of Textile and Jute, Ministry of Fisheries and Livestock, Ministry of Commerce, Bangladesh Textile Mills Association, Bangladesh Garment Manufacturers and Exporters Association and the Bangladesh Knitwear Manufacturers and Exporters Association.

The data collection approach described below draws on the ILO (2008) document on data availability, in particular, table D18. This has been updated to reflect a BSCO occupational classification and a qualification approach based on NTVQF.

The objective is to build up a more detailed industry-occupation-qualifications matrix (IOQ matrix). It is recommended that each industry ISC would be resourced and tasked to collect this data by survey of employers/enterprises. The roles of the ISCs are discussed further below in Section 3.5.12.2.

Table 15 below is an adaption of Tables D18 from the ILO's report on the availability of TVET data in Bangladesh (ILO2008). This table provides illustrative segments of the data which would be collected via a recommended Employer/Enterprise Survey Series – surveys conducted by the ISC's, initially in priority industries, and eventually across all significant industries. For example, Table 15 refers to BSCO occupations in the Readymade Garments, Pharmaceuticals, and Textile Mills sub-sectors of the Manufacturing Industry. The level of employment and the required qualification for each occupation would be recorded in the surveys and survey results would be factored up according to total employment in the industry sub-sector. The design and conduct of these surveys would be undertaken in association with the NDC. BBS could be contracted to undertake the actual survey execution and should be encouraged to contribute to funding the surveys as an extension of its existing enterprise surveys.

**Table 15: ILO2008 Table D18 reinterpreted to BSCO, Employment and qualification breakdown of existing workers by the economic sector and sub-sector**

| N | Manufacturing Industry                                  | Sub-sectors                                | Employment<br>(thousands) | Qualification structures (NTVQF) |               |               |               |               |
|---|---------------------------------------------------------|--------------------------------------------|---------------------------|----------------------------------|---------------|---------------|---------------|---------------|
|   |                                                         |                                            |                           | Certificate 1                    | Certificate 2 | Certificate 3 | Certificate 4 | Certificate 5 |
|   | Field Reported ILO2008                                  | Wearing apparel                            |                           |                                  |               |               |               |               |
|   | More detailed field breakdown<br>linked to 2 digit BSCO | Readymade Garments                         |                           |                                  |               |               |               |               |
|   | 034                                                     | Administrative assistant/computer operator |                           |                                  |               |               |               |               |
|   | 035                                                     | Security guard, office peon etc.           |                           |                                  |               |               |               |               |
|   | 036                                                     | Swing operator                             |                           |                                  |               |               |               |               |
|   | 037                                                     | Iron man                                   |                           |                                  |               |               |               |               |
|   | 038                                                     | Packing & folding labour                   |                           |                                  |               |               |               |               |
|   | 039                                                     | Cutting man                                |                           |                                  |               |               |               |               |
|   | 040                                                     | Knitting operator                          |                           |                                  |               |               |               |               |
|   | 041                                                     | Helper (Cutting knitting etc.)             |                           |                                  |               |               |               |               |
|   | Field Reported by ILO2008                               | Drugs & pharmaceutical                     |                           |                                  |               |               |               |               |
|   | More detailed field breakdown<br>linked to 2 digit BSCO | <b>Pharmaceuticals</b>                     |                           |                                  |               |               |               |               |
|   | 062                                                     | Medicine production machine operator       |                           |                                  |               |               |               |               |
|   | 063                                                     | Medicine production labour                 |                           |                                  |               |               |               |               |

| N | Manufacturing Industry                               | Sub-sectors                                  | Employment<br>(thousands) | Qualification structures (NTVQF) |               |               |               |               |
|---|------------------------------------------------------|----------------------------------------------|---------------------------|----------------------------------|---------------|---------------|---------------|---------------|
|   |                                                      |                                              |                           | Certificate 1                    | Certificate 2 | Certificate 3 | Certificate 4 | Certificate 5 |
|   | 064                                                  | Toiletries goods production machine operator |                           |                                  |               |               |               |               |
|   | 065                                                  | Toiletries production labour                 |                           |                                  |               |               |               |               |
|   | Field Reported by ILO2008                            | Mfg. of textile                              |                           |                                  |               |               |               |               |
|   | More detailed field breakdown linked to 2 digit BSCO | <b>Textile mill</b>                          |                           |                                  |               |               |               |               |
|   | 021                                                  | Spinning machine mechanic                    |                           |                                  |               |               |               |               |
|   | 022                                                  | Spinning machine operator                    |                           |                                  |               |               |               |               |
|   | 023                                                  | Spinning machine helper                      |                           |                                  |               |               |               |               |
|   | 024                                                  | Weaving machine mechanic                     |                           |                                  |               |               |               |               |
|   | 025                                                  | Daily labour of similar works                |                           |                                  |               |               |               |               |
|   | 026                                                  | Weaving machine operator                     |                           |                                  |               |               |               |               |
|   | 027                                                  | Weaver/weaving labour                        |                           |                                  |               |               |               |               |
|   | 028                                                  | Dying machine mechanic                       |                           |                                  |               |               |               |               |
|   | 029                                                  | Dying machine operator                       |                           |                                  |               |               |               |               |
|   | 030                                                  | Dyer                                         |                           |                                  |               |               |               |               |
|   | 031                                                  | Knitting machine mechanic                    |                           |                                  |               |               |               |               |

Once this data is collected across multiple industries it will be possible to assemble a detailed IOQ matrix.

IOQ matrix is the basis for calculating future demand for skills and qualifications. Table 16 shows a generic representation of the IOQ matrix.

**Table 16: Industry by occupation by qualification matrix in generic representative form. The key occupations for each industry are further broken down to the numbers of persons required at particular qualification levels for each occupation.**

| Industry 1             |                           |                          |                          |     |
|------------------------|---------------------------|--------------------------|--------------------------|-----|
|                        | Qualification 1.<br>NTVQF | Qualification 2<br>NTVQF | Qualification 3<br>NTVQF | ... |
| (BSCO)<br>Occupation 1 |                           |                          |                          |     |
| Occupation 2           |                           |                          |                          |     |
| Occupation 3           |                           |                          |                          |     |
| Industry 2             |                           |                          |                          |     |
| (BSCO)<br>Occupation 1 |                           |                          |                          |     |
| ...                    |                           |                          |                          |     |

Having identified the IOQ matrix as the basis for future skills and qualification demand estimates it is necessary to identify other factors that will affect the demand for skills and qualifications into the future. These are:

- overseas demand for Bangladeshi workers: to the extent that there are net outflows of workers within a given period this will increase the demand for skills locally
- on-the-job training: on-the-job training will tend to reduce the demand for skills and qualifications from the TVET system depending on the type of training that has undertaken and the extent to which skill outcomes are recognised as qualifications
- pre-existing skill shortages: pre-existing skill shortages will tend to increase the demand for skills from the TVET system
- changes in technology - changes in technology will affect the composition of the demand for skills.
- replacement demand due to the retirement of workers from the workforce because of death, disability or illness or other reasons causing temporary absence from the workforce: the loss of skills due to such factors will increase the demand for skills to fill such unanticipated vacancies

The proposed methods for dealing with these influences will be discussed below following the discussion of how to project the future demand for skills from the IOQ matrix.

It should be emphasised that NTVQF is new in Bangladesh and that the application of BSCO is incomplete. Our view is that this should not be a barrier to the implementation of a system based on these standards. This should begin with priority industries but spread to all other industries in time. It is not possible to build an empirically-based system of planning without the adoption of universal standards such as NTVQF and BSCO. Industries that participate in the adoption of these standards stand to gain from better access to required skills and this aspect of the proposed system should be promoted to all industries to encourage their participation.

### 3.5.6 Projecting future demand for skills and qualifications

Once skills have been aggregated across industries the result will be the IOQ matrix which shows the occupational and qualifications composition of employment in all industries and in aggregate. It is expected that data for priority industries will be gathered initially with others added at a later date.

Once the IOQ matrix has been populated with the appropriate data the task of predicting future distributions is relatively straightforward.

Various government agencies – the Ministry of Industries, the Export Promotion Bureau, the Board of Investment and others – generate projections of industry growth rates. These projections will be based on data from a number of sources but should include both government and industry sources. The projected growth rates of particular industries can be applied to occupational/qualifications matrices to derive estimates of future expected levels of employment by occupation and qualification.

Once it is populated with the appropriate data, the IOQ matrix shows our current knowledge about the occupational and qualifications structure of each industry and the industries that have been surveyed in aggregate. The next task is to use this set of data as a basis for projecting the demand to skills in the future. The basic method we propose is to project the occupational and qualifications composition of a particular industry by the industry's expected growth rate and then to adjust the projected demand to skills to account for the issues described above such as overseas workers, replacement demand etc.

Figure 2 below provides a high-level description of the proposed method for projecting skills demand for each industry. The steps are as follows:

**Step 1:** From existing data held by the Ministry of Industries, the Export Promotion Bureau, the Board of Investment and others, generate projections of industry growth rates over a defined period, in this example, 5 years. These projections will be based on data from a number of sources including both government and industry sources. Generally, such projections will be expressed in terms of the value of output of the industry into the future. An assumption in this approach is that the relationship between the value of output and the input of labour does not change over time. To some extent,

we will introduce a relaxation of this assumption when we deal with technological change below.

**Step 2:** The annual projected growth rates for each industry are then applied to each cell of the IOQ matrix. For example, assume we are undertaking a five-year projection starting in 2011. The result will be a '3-dimensional' IOQ matrix now with an added time dimension. The projected employment level for each occupational and qualification combination can then be identified for each year in the projection period. These levels can be interpreted as a first approximation of future demand for skills.

**Table 17: The IOQ matrix projected for five years**

| Industry 1          | Qualification 1. NTVQF | Qualification 2. NTVQF | Qualification 3. NTVQF | ... |
|---------------------|------------------------|------------------------|------------------------|-----|
| (BSCO) Occupation 1 |                        |                        |                        |     |
| Occupation 2        |                        |                        |                        |     |
| Occupation 3        |                        |                        |                        |     |

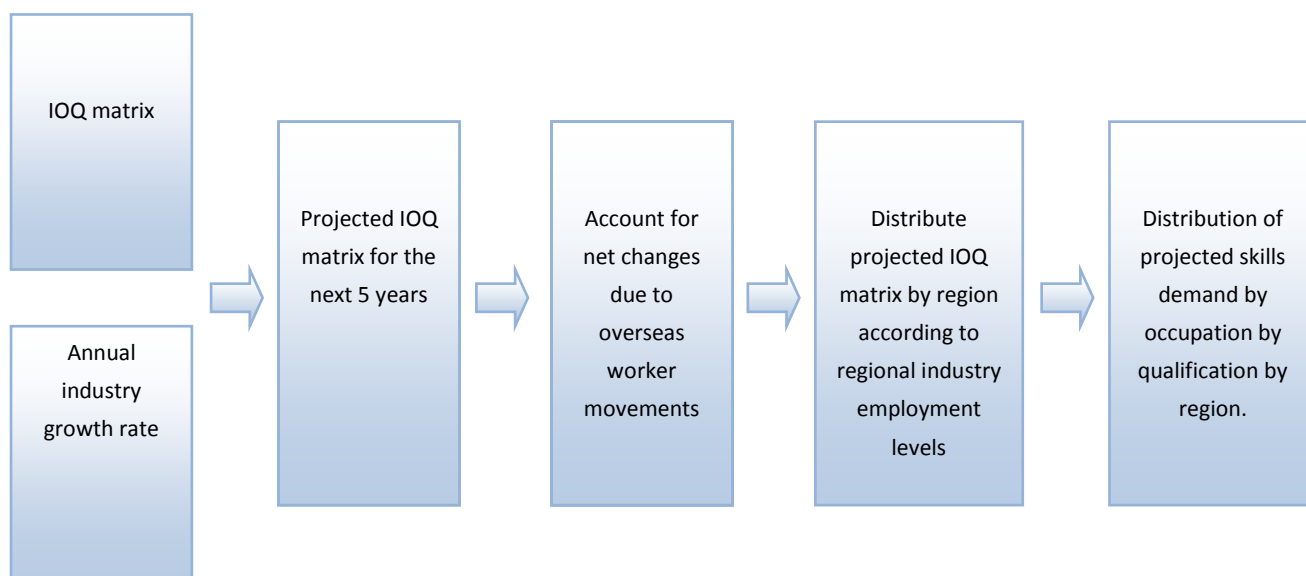
2011 2012 2013 2014 2015 2016

**Step 3:** The next step is to incorporate factors that can be reasonably reliably quantified. Here the net impact of the outflow and inflow of Bangladeshi workers overseas can be calculated with a relatively high level of accuracy by gathering occupational and qualifications data from all outgoing and incoming overseas workers. Again, this will require projection to estimate future net impacts. Such estimates may not be possible until accurate data is collected for some time on outgoing and incoming workers. The approach to the incorporation of data about overseas workers is discussed in more detail below in Section 0.

**Step 4:** It may also be desirable to distribute projections of future demand skills by region. On an industry-by-industry basis this could be done simply by distributing projected employment levels pro-rata according to regional levels of employment.

**Step 5:** Once the NTVQF demand estimates are calculated they can then be distributed across regions based on the regional distribution of industry employment.

**Figure 2: Method of projecting qualification demand from each industry**



Below we illustrate how the data might appear (in a generic tabulature format) at each stage of the method.

**Step 1: Identify industry growth rates.**

| Industry 1 |                       |
|------------|-----------------------|
| Year       | Growth rate of output |
| Year 1     | a%                    |
| Year 2     | b%                    |
| Year 3     | c%                    |
| Year 4     | d%                    |
| Year 5     | e%                    |

**Step 2: Apply industry growth rates to IOQ matrix (see Table 17)**

**Step 3: Apply net impacts due to overseas worker movements**

| Industry 1             |                          |                                                |                          |                                                |     |
|------------------------|--------------------------|------------------------------------------------|--------------------------|------------------------------------------------|-----|
|                        | Qualification 1<br>NTVQF | Net change<br>due to OS<br>worker<br>movements | Qualification 2<br>NTVQF | Net change<br>due to OS<br>worker<br>movements | ... |
| (BSCO)<br>Occupation 1 |                          | xxx                                            |                          | yyy                                            |     |
| Occupation 2           |                          | ...                                            |                          | ...                                            |     |
| Occupation 3           |                          |                                                |                          |                                                |     |
| Industry 2             |                          |                                                |                          |                                                |     |
| (BSCO)<br>Occupation 1 |                          |                                                |                          |                                                |     |
| ...                    |                          |                                                |                          |                                                |     |

**Step 4: Distribute projected IOQ matrix by region according to existing regional distribution of industry employment (cells below will now incorporate net effects of overseas workers)**

| Region 1               |                           |                          |                          |     |
|------------------------|---------------------------|--------------------------|--------------------------|-----|
| Industry 1             |                           |                          |                          |     |
|                        | Qualification 1.<br>NTVQF | Qualification 2<br>NTVQF | Qualification 3<br>NTVQF | ... |
| (BSCO)<br>Occupation 1 |                           |                          |                          |     |
| Occupation 2           |                           |                          |                          |     |
| Occupation 3           |                           |                          |                          |     |
| Industry 2             |                           |                          |                          |     |
| (BSCO)<br>Occupation 1 |                           |                          |                          |     |
| ...                    |                           |                          |                          |     |

### 3.5.7 Accounting for other factors influencing the demand for skills and qualifications

Once the IOQ matrix has been projected and adjusted for overseas worker movements, the values can be aggregated across industries that are included to form estimates of future demand for skills. These figures, however, need to be modified to take account of other factors influencing the demand for skills, specifically:

- pre-existing skill shortages
- on-the-job training
- technological change
- replacement demand.

We do not believe that it is a useful approach to attempt to deal with each of these in a direct quantitative manner as in the case of overseas demand influences. The main reason for this is that it is not possible to obtain, for the variety of reasons discussed above in 3.5.1, accurate data on these factors.

In the case of pre-existing skill shortages previously discussed for example, there are many problems associated with definition and very real problems associated with measurement given that it is always in the interests of employers to overstate skill shortages. This is not to say that skills shortages do not exist. Rather it is to emphasise that, given the level of detail embedded in the IOQ matrix approach, it is not productive to attempt to construct a corresponding detailed matrix for shortages. It simply would not be possible to obtain reliable estimates of skill shortage to the level of detail for individual occupations and their qualifications requirements.

If such a matrix were constructed by, for example, pro-rata application of occupational distributions to broad estimates of shortages in specific industries, the resultant tables would be characterised by spurious accuracy.

Given the limitations to accuracy and the cost of increasing accuracy it is neither possible nor desirable to devise a completely quantitative, deterministic solution that takes into account all factors associated with the demand for skills and qualifications. This does not mean that nothing can be done – methods to provide estimates are discussed below. The implication of this is that some level of qualitative approach is necessary in which the judgement of informed parties is required – in this case the NDC and ISCs.

Below we discuss how each of the identified influences on the demand for skills can be factored into estimates of future demand for skills and qualifications.

### 3.5.7.1 Pre-existing skill shortages

Pre-existing skill shortages can be incorporated into the proposed method in a number of ways. First it is important to once more emphasise that skills shortages are very difficult to define and measure empirically and therefore any inclusion of skills shortages in the estimation of future skills and qualifications demand needs to be approached critically, even sceptically.

During discussions with employer groups, stakeholders were eager to emphasise that, in most cases, significant skills shortages existed. Clearly, employers and their representative groups have an interest in promoting this point.

We believe that the best feasible approach is for employers and their representative groups, the ISCs and the NDC to engage in a dialogue and review process which will result in the explicit modification of the demand estimates in the IOQ matrix projections.

The process could begin with the industry proposing a detailed definition of current shortages in terms of the specific occupational and qualifications relevant to these categories in the current period IOQ matrix. In addition, industry would propose the rate at which the shortage should be addressed.

For example if it were determined that there was a shortage of 1,000 electricians in the textiles industry it may be proposed that an extra 200 electricians per year should be trained over the five-year planning period. Alternatively, this might be considered unrealistic and it might be determined that only 500 of the total shortage of 1,000 would attempt to be closed within the five-year planning period and only 100 extra electricians per year would be trained.

Each ISC could assist employers and/or employer groups in developing these forward adjustments to the IOQ matrix projections. It would be critical to emphasise to the ISCs that their role is not industry representation and they would be expected to take a critical role in assessing the proposals of their respective industry and require solid evidence of claimed shortages.

Once each ISC was satisfied the shortages and proposed extent to which they should addressed were justified it would make written submission to the NDC which would review and approve the recommendations or return them for modification. Once finalised, the proposed adjustments would be added to the projected IOQ matrix.

In their review processes both the ISC's and NDC would review data that would assist them in ascertaining the veracity of claims from each industry regarding skill shortages. Two types of data would be of primary interest in this regard: student outcomes data and job vacancies data. These are discussed below in Sections 3.6.1 and 0 respectively.

**Table 18: Applying impacts of skill shortages**

|            |  |  |  |  |  |
|------------|--|--|--|--|--|
| Industry 1 |  |  |  |  |  |
|------------|--|--|--|--|--|

|                        | Qualification<br>1<br>NTVQF | Net change<br>due to<br>adjustment<br>for shortages | Qualification<br>2<br>NTVQF | Net change<br>due to<br>adjustment<br>for shortages | ... |
|------------------------|-----------------------------|-----------------------------------------------------|-----------------------------|-----------------------------------------------------|-----|
| (BSCO)<br>Occupation 1 |                             | xxx                                                 |                             | yyy                                                 |     |
| Occupation 2           |                             | ...                                                 |                             | ...                                                 |     |
| Occupation 3           |                             |                                                     |                             |                                                     |     |
| <b>Industry 2</b>      |                             |                                                     |                             |                                                     |     |
| (BSCO)<br>Occupation 1 |                             |                                                     |                             |                                                     |     |
| ...                    |                             |                                                     |                             |                                                     |     |

Methodologically there are no issues in incorporating skill shortages into this method, the problems remain as usual in definition and measurement.

### 3.5.7.2 On-the-job training

On-the-job training is a major source of skills formation in Bangladesh as it is in most countries of the world. The focus of this study is the TVET system and therefore the focus is on on-the-job training in this report that complements, or is a substitute, for TVET training.

We propose a treatment for on-the-job training that is similar to the treatment of skill shortages discussed above.

Again, industry and ISCs, through dialogue and review determine what training will be undertaken on-the-job. The impact of industry undertaking this training on the forward projection of skills demand is determined and agreed. This plan is then submitted to the NDC and once approved the appropriate estimates in the IOQ matrix are updated to reflect training negotiated to be done in industry to address future skill requirements.

The process of review and documentation is critical and the ISC's will be responsible for monitoring the level of on-the-job training undertaken in each industry and comparing this with levels projected in previous periods.

In this way the ISC's and the NDC can build up a picture over time of which industries and representative groups are best able to meet their commitments.

**Table 19: Negotiated targets for on-the-job training by industry**

|                   |  |  |  |  |  |
|-------------------|--|--|--|--|--|
| <b>Industry 1</b> |  |  |  |  |  |
|-------------------|--|--|--|--|--|

|                        | Qualification<br>1<br>NTVQF | Net change<br>due to on-the-<br>job training | Qualification<br>2<br>NTVQF | Net change due<br>to on-the-job<br>training | ... |
|------------------------|-----------------------------|----------------------------------------------|-----------------------------|---------------------------------------------|-----|
| (BSCO)<br>Occupation 1 |                             | xxx                                          |                             | yyy                                         |     |
| Occupation 2           |                             | ...                                          |                             | ...                                         |     |
| Occupation 3           |                             |                                              |                             |                                             |     |
| <b>Industry 2</b>      |                             |                                              |                             |                                             |     |
| (BSCO)<br>Occupation 1 |                             |                                              |                             |                                             |     |
| ...                    |                             |                                              |                             |                                             |     |

### 3.5.7.3 Changes in technology

Changes in technology have many and profound impacts on industries and economic systems. In the context of this report, however, we are concerned with the impact of technological change in industry on the demand for skills. For example, the introduction of new capital equipment will lead to changes in production processes that may lead to significant reductions in the numbers of persons with a particular skill or qualification that are required by employers in the industry. However anticipating such changes is very difficult and that it is only employers and their representative groups who are likely to have relatively accurate information on advances in technology. Again, we propose a process of dialogue and review to determine the impact of such change on the future demand for skills similar to the method described above.

**Table 20: Applying the impact of changes in technology to skills demand**

| <b>Industry 1</b>      |                             |                                    |                             |                                 |     |
|------------------------|-----------------------------|------------------------------------|-----------------------------|---------------------------------|-----|
|                        | Qualification<br>1<br>NTVQF | Net change<br>due to<br>technology | Qualification<br>2<br>NTVQF | Net change due<br>to technology | ... |
| (BSCO)<br>Occupation 1 |                             | xxx                                |                             | yyy                             |     |
| Occupation 2           |                             | ...                                |                             | ...                             |     |
| Occupation 3           |                             |                                    |                             |                                 |     |
| <b>Industry 2</b>      |                             |                                    |                             |                                 |     |
| (BSCO)<br>Occupation 1 |                             |                                    |                             |                                 |     |
| ...                    |                             |                                    |                             |                                 |     |

### 3.5.7.4 Replacement demand

The workforce is complex and constantly changing. In any given year individuals leave the workforce due to retirement, illness or death. Individuals may also change industry

or occupations. They also may become unemployed or temporarily work part-time because of other commitments such as child care. Changes in the national participation rate, the proportion of the population that participates in the workforce, also has significant impacts on the labour force. This is not just its size but also its demographic composition, and these changes can be unpredictable.

The two main existing sources for this type of data are the LFS and the census. This type of data is important for a number of different policy purposes. Demographic data, age distributions, incidence of illness and death etc are relevant to planning for health care, social welfare and education.

We recommend monitoring the impact of broad demographic trends on the labour force. The LFS records age distributions and these can be used to calculate the average impacts on the labour force of retirement and, critically, changes in the participation rate. As the data about occupational and qualification distributions improves it will be possible to translate broader demographic trends into more detailed impacts on occupations and skills.

A table such as Table D24: Annual replacement needs for technicians and skilled workers from the ILO's report on the availability of TVET data in Bangladesh (ILO 2008) could be used to collect data on which to base the need for replacement demand (suitably updated to be based on BSCO and NTVQF). An indicative form of such a table is provided in Table 21.

**Table 21:** Adapted from Table D24: Annual replacement needs for technicians and skilled workers (ILO 2008)

| N | Sub-sector                                 | Technician and skilled worker qualifications (NTVQF)          | Numbers per qualification employed | Average exits each year | Replacement need (%) |
|---|--------------------------------------------|---------------------------------------------------------------|------------------------------------|-------------------------|----------------------|
|   | <b>Industry 1: BSCO</b>                    |                                                               |                                    |                         |                      |
|   | Wearing apparel                            | Shift manager<br>Apparel designer<br>Cloth cutter             | 200<br>1000<br>5000                | 20<br>50<br>500         | 10%<br>5%<br>10%     |
|   | Drugs & pharmaceutical                     | Fitter                                                        | 500                                |                         |                      |
|   | Mfg. of textile                            | Maintenance technician/ looms<br>Weaver<br>Quality controller | 500<br><br>10,000                  |                         |                      |
|   | Food manufacturing                         |                                                               |                                    |                         |                      |
|   | Tobacco manufacturing                      |                                                               |                                    |                         |                      |
|   | Other chemical production                  |                                                               |                                    |                         |                      |
|   | ...                                        |                                                               |                                    |                         |                      |
|   | <b>Industry 2: BSCO</b>                    |                                                               |                                    |                         |                      |
|   | Education                                  |                                                               |                                    |                         |                      |
|   | Health, etc.                               |                                                               |                                    |                         |                      |
|   | Financial services, Banking, and Insurance |                                                               |                                    |                         |                      |
|   | ...                                        |                                                               |                                    |                         |                      |

Identifying labour force exits, and therefore replacement demand, for the current year is reasonably straightforward. But projecting future exits/replacement demand is much more difficult. Changes in the health and behaviours of people of working age can

significantly affect average rates of exit from the labour force in ways that are hard to predict.

Given the complex factors that affect exit rates and replacement needs, there is no substitute to building knowledge and expertise in the areas of demographic influences on labour force participation in order to make meaningful projections. Building this type of knowledge would be one of the functions that the NDC would need to undertake over time. Further, we suggest that the NDC should seek, over time, to build relationships with specialist research organisations and individual researchers with expertise in the fields of demographics and labour economics in order to assist in the development of such new knowledge.

In terms of an appropriate method for incorporating the impacts of demographic change we would again propose a similar process as described above.

**Table 22: Applying impacts of demographic changes to skills demand**

| Industry 1             |                             |                                               |                             |                                            |     |
|------------------------|-----------------------------|-----------------------------------------------|-----------------------------|--------------------------------------------|-----|
|                        | Qualification<br>1<br>NTVQF | Net change<br>due to<br>demographic<br>change | Qualification<br>2<br>NTVQF | Net change due<br>to demographic<br>change | ... |
| (BSCO)<br>Occupation 1 |                             | xxx                                           |                             | yyy                                        |     |
| Occupation 2           |                             | ...                                           |                             | ...                                        |     |
| Occupation 3           |                             |                                               |                             |                                            |     |
| Industry 2             |                             |                                               |                             |                                            |     |
| (BSCO)<br>Occupation 1 |                             |                                               |                             |                                            |     |
| ...                    |                             |                                               |                             |                                            |     |

### 3.5.8 Data on the impact of overseas workers on demand for skills and qualifications

Overseas demand for Bangladeshi workers also needs to be factored in as part of the process of estimating the national demand for qualifications and skills.

Again, the concept of stocks and flows is relevant. In 2009 there were approximately six million Bangladeshi workers overseas. This can be said to be the stock of overseas workers.

The size of this stock in any period, say, a year is determined by two flow variables: inflows to the stock – the number of Bangladeshi workers leaving for overseas work; and outflows from the stock – the number of Bangladeshi workers returning to Bangladesh from overseas.

We already know BMET records a high level of detail on departing workers' skills and qualifications although in discussions with stakeholders some comments were made that this data is not rigorously collected or verified. Further to our knowledge there is no data collected about returning workers.

This is a critical gap in the data. The number of returning workers needs to be recorded, their skill qualification levels confirmed. These could have possibly changed while they were working overseas and a number of qualitative variables could usefully be collected at the point of return.

Primarily, it would be useful to know whether the particular skills and qualifications of overseas and Bangladeshi workers were useful and more advantageous in overseas workplaces and to determine whether returning workers have any useful information about what skills or qualifications may be most useful in overseas labour markets.

For example returning workers should have useful detail and 'on the ground' intelligence about these labour markets. This could include new skills that they have learned and found to be valuable while overseas. This information could be extracted if appropriate interview techniques are employed.

To assess the impact of overseas workers on the demand and supply of skills and qualifications in Bangladesh the levels of inflows to and outflows from stock of overseas workers need to be calculated for each skill/qualification category.

**Table 23: Recording outflows of Bangladeshi workers in a given year**

| Outflows<br>20xx      |                             |                             |     |
|-----------------------|-----------------------------|-----------------------------|-----|
|                       | Qualification<br>1<br>NTVQF | Qualification<br>2<br>NTVQF | ... |
| (BSO)<br>Occupation 1 |                             |                             |     |
| Occupation 2          |                             |                             |     |
| Occupation 3          |                             |                             |     |
| ...                   |                             |                             |     |

**Table 24: Recording inflows of Bangladeshi workers in a given year**

| Inflows<br>20xx |                             |                             |     |
|-----------------|-----------------------------|-----------------------------|-----|
|                 | Qualification<br>1<br>NTVQF | Qualification<br>2<br>NTVQF | ... |

|                        |  |  |  |
|------------------------|--|--|--|
| (BSCO)<br>Occupation 1 |  |  |  |
| Occupation 2           |  |  |  |
| Occupation 3           |  |  |  |
| ...                    |  |  |  |

We recommend that data on qualifications and occupation according to NTVQF and BSCO be collected at both the point of exit and return as indicated in Table 23 and Table 24.

For any given year, the net flows overseas will be equal to the difference between outflows and inflows and this figure is what should be entered into the table under Step 3 in Section 3.5.6.

In terms of demand projection, we recommend that BMET be tasked with developing estimates of overseas demand by major country markets and in aggregate. The existing Research, Monitoring & Computer cell within BMET should be strengthened to allow more systematic collection and verification of data from overseas markets, including from sources outside BMET. Sources of data on overseas demand would include national published statistics, analysis of business trends and reports in local media on economic development and special large projects. Lines of communication should be set up between this cell in BMET and the appropriate sections of Bangladesh embassies abroad. The Bangladesh Association of International Recruitment Agencies (BAIRA) was interviewed as part of this project and has considerable knowledge and expertise on the demand for overseas Bangladeshi workers. They should be regarded as a valuable contributor to the activities of the strengthened BMET data cell.

Essentially, their task would be to build their knowledge and expertise of the factors determining the inflows and outflows of Bangladeshi workers and to build these into projections for future years in tables such as those represented by Table 23 and Table 24. These projections will necessarily be contingent upon our range of quantitative and qualitative inputs that cannot be reduced to a simple and mechanistic approach. If useful projections in this area are to be developed there is no alternative to building knowledge and expertise and exercising informed judgement.

### 3.5.9 Demand and supply matching

The sections above have shown how various factors that impact on the demand for skills and qualifications can be incorporated into projections of the demand to skills and qualifications.

We have indicated where this can be undertaken in a relatively mechanistic way and where the consideration of broader factors is necessary requiring expert assessment, contingent projection and the exercise of judgement in arriving at the most likely influences on the demand of skills and qualifications.

The result of this analysis will be a projected IOQ matrix such as that shown in Table 17 but one that incorporates all of the influences discussed above. This set of projections will represent the baseline survey-based estimates of occupational and qualifications composition of target groups in target industries combined with projections of the influence of the various factors on demand discussed above.

Once these projections are summed across industry the result will be aggregate projections of demand by occupation and qualification. This data will be a core input into the planning of the TVET sector in terms of the output of qualifications it produces into the future. This data will need to be considered in association with other factors, for example, the National strategic priority of various industries and the relative costs associated with developing particular types of qualifications.

### 3.5.10 Other comments on demand for skills and qualifications

The previous section specifies how the effect of skill shortage, technological change etc are to be incorporated into the projections of future demand for skills. The result is an IOQ matrix that indicates demand for skills into the future and this can be used as an input into decisions regarding the numbers of positions to be made available over time in the TVET system

It needs to be emphasised that for some occupation/qualification pairs the correspondence between qualification and occupation will be quite ‘tight’ because some particular qualifications have a highly specific occupation associated with them. For example, it is highly probable that a student who graduates as an electrical tradesman will work as an electrician. For other qualifications, however, the link will be much looser. For example, there are many possible occupations that an IT graduate may enter.

These characteristics of qualifications and the labour force place an upper limit on the accuracy of data and projections irrespective of the resources available for data collection.

The implication is that it is possible to train a person for a specific occupation where it has been identified that a shortage exists for that occupation. However it is not possible to guarantee that this person, once he or she has completed training, will enter that particular occupation in the particular industry where the shortage exists.

### 3.5.11 An example of a skills demand estimation process

To see how such estimation processes are developed in other countries we provide below an example from the Australian construction industry. Table 25 shows data on the projected growth in employment by sector within the Australian construction industry. These projections are derived using economic forecasting based on computable general equilibrium models.

The following tables are provided again, not necessarily as prescriptive for Bangladesh, but rather to illustrate the method and detail that is available using this particular technique. The difference between the technique described above for Bangladesh and this example is the method used to forecast growth in the sector. Specifically this is the use of computable general equilibrium modelling. It may be that, over time the ISCs and

NDC develop models of industry growth that produce different projections from those of the Bangladesh planning ministries.

**Table 25: Employment forecasts, Construction and Property Services Industries, 2004-05 to 2012-13**

| Industry                           | Employment<br>2004-05 | Employment<br>forecast 2012-13 | Total change<br>2002-05 to 2012-13 | Average annual<br>growth<br>2004-05 to 2012-13 |
|------------------------------------|-----------------------|--------------------------------|------------------------------------|------------------------------------------------|
|                                    | Persons '000s         | Persons '000s                  | % change                           | % change                                       |
| Building completion services       | 190.1                 | 197.4                          | 3.8                                | 0.5                                            |
| Building construction              | 199.5                 | 206.9                          | 3.7                                | 0.5                                            |
| Building structure services        | 94.7                  | 98.2                           | 3.7                                | 0.5                                            |
| Machinery/equipment hiring/leasing | 26.7                  | 33.0                           | 23.8                               | 2.7                                            |
| Other business services            | 331.7                 | 406.2                          | 22.4                               | 2.6                                            |
| Other wood products                | 37.1                  | 41.8                           | 12.7                               | 1.5                                            |
| Property operators/developers      | 34.7                  | 42.5                           | 22.6                               | 2.6                                            |
| Real estate agents                 | 95.9                  | 118.3                          | 23.4                               | 2.7                                            |
| Services to road transport         | 4.9                   | 5.2                            | 5.4                                | 0.7                                            |
| Technical services                 | 141.2                 | 174.0                          | 23.2                               | 2.7                                            |
| <b>All industries</b>              | <b>9,800.0</b>        | <b>10,951.2</b>                | <b>11.8</b>                        | <b>1.4</b>                                     |

Source: Industry Skills Report, Construction and Property Services, June 2006

In Table 26 we see the distribution of occupational categories across industry types. It can be seen that the data are highly detailed compared with anything available in Bangladesh. It needs to be emphasised that data of this detail is not based on direct survey but rather on econometric modelling methods that necessarily make various assumptions about the occupational composition of the industry and the composition of industry subsectors.

This table is, in effect, a matrix of the distribution of detailed occupations across industry subsectors at a point in time and is used as a baseline for forming the projections. As stated elsewhere in this report, the fundamental limitation of this approach is that these compositions or structures change over time and to the extent that they do change the projections based on them are subject to error.

Table 26: Location of workers across Construction and Property Services industries 2003-0411

| Industry                                   | Other wood product manufacturing | Building construction | Building structure services | Building completion services | Services to road transport | Property operators and developers | Real estate agents | Technical services | Other business services | Private households employ staff | Other | Total construction and Property services | Other industries | All Industries |
|--------------------------------------------|----------------------------------|-----------------------|-----------------------------|------------------------------|----------------------------|-----------------------------------|--------------------|--------------------|-------------------------|---------------------------------|-------|------------------------------------------|------------------|----------------|
| Occupation                                 | '000                             | '000                  | '000                        | '000                         | '000                       | '000                              | '000               | '000               | '000                    | '000                            | '000  | '000                                     | '000             | '000           |
| Building & Engineering Professionals       | 0.1                              | 3.0                   | 0.3                         | 0.2                          | 0.0                        | 0.4                               | 0.1                | 42.8               | 0.7                     | 0.0                             | 0.1   | 47.7                                     | 68.9             | 116.6          |
| Building & Eng Associate Professionals     | 0.3                              | 14.9                  | 0.8                         | 0.5                          | 0.0                        | 0.6                               | 0.3                | 17.9               | 1.0                     | 0.0                             | 0.1   | 36.5                                     | 51.2             | 87.7           |
| Electrical & Electronics Trades            | 0.2                              | 2.3                   | 0.1                         | 0.2                          | 0.0                        | 0.1                               | 0.0                | 1.4                | 3.4                     | 0.0                             | 0.4   | 8.1                                      | 187.4            | 195.5          |
| Elementary Service Workers                 | 0.0                              | 0.4                   | 0.0                         | 0.0                          | 2.2                        | 0.8                               | 0.7                | 0.1                | 37.6                    | 0.3                             | 0.1   | 42.2                                     | 74.4             | 116.6          |
| Final Finish Construction Tradespersons    | 0.1                              | 1.7                   | 0.1                         | 43.5                         | 0.0                        | 0.0                               | 0.0                | 0.0                | 0.3                     | 0.0                             | 0     | 45.8                                     | 11.2             | 57.0           |
| Intermediate Clerical                      | 2.4                              | 8.9                   | 1.9                         | 3.7                          | 0.5                        | 5.0                               | 10.7               | 7.3                | 40.0                    | 0.0                             | 3.1   | 83.5                                     | 829.9            | 913.4          |
| Intermediate Mining & Construction workers | 0.2                              | 3.8                   | 2.9                         | 1.5                          | 0.0                        | 0.0                               | 0.0                | 0.1                | 0.7                     | 0.0                             | 0.4   | 9.6                                      | 31.3             | 40.9           |
| Mine, Construction & Related Labourers     | 0.3                              | 19.9                  | 22.8                        | 2.6                          | 0.0                        | 0.2                               | 0.1                | 2.0                | 1.7                     | 0.0                             | 0.3   | 49.9                                     | 49.7             | 99.6           |
| Misc Business & Admin Assoc Professionals  | 0.7                              | 7.2                   | 0.8                         | 1.4                          | 0.1                        | 5.4                               | 55.9               | 4.6                | 11.1                    | 0.1                             | 1     | 88.2                                     | 196.0            | 284.2          |
| Misc. Business & Information Profess.      | 0.1                              | 1.7                   | 0.1                         | 0.0                          | 0.0                        | 2.5                               | 3.5                | 1.4                | 19.5                    | 0.0                             | 0.1   | 28.9                                     | 107.8            | 136.7          |
| Miscellaneous Generalist Managers          | 1.2                              | 36.1                  | 1.3                         | 1.8                          | 0.0                        | 0.2                               | 0.2                | 1.3                | 0.3                     | 0.0                             | 0.1   | 42.7                                     | 44.5             | 87.2           |
| Misc. Labourers & Related Workers          | 0.3                              | 4.2                   | 0.3                         | 1.1                          | 0.1                        | 0.7                               | 0.7                | 0.2                | 2.3                     | 0.0                             | 0.4   | 10.3                                     | 70.9             | 81.2           |
| Misc. Managing Supervisors (Sales/Service) | 0.1                              | 0.4                   | 0.1                         | 0.2                          | 0.1                        | 0.3                               | 0.3                | 0.2                | 14.1                    | 0.0                             | 3.6   | 19.2                                     | 88.2             | 107.4          |
| Mobile Plant Operators                     | 1.1                              | 1.7                   | 0.5                         | 0.2                          | 0.1                        | 0.3                               | 0.0                | 0.4                | 2.0                     | 0.0                             | 0.2   | 8.3                                      | 114.2            | 122.5          |
| Other adv. Clerical/Service                | 0.7                              | 5.2                   | 2.2                         | 3.9                          | 0.0                        | 0.7                               | 3.9                | 2.0                | 4.8                     | 0.1                             | 0.8   | 24.2                                     | 174.5            | 198.7          |
| Other Occupations                          | 12.2                             | 21.0                  | 8.5                         | 10.1                         | 2.1                        | 8.9                               | 8.0                | 29.8               | 82.9                    | 3.0                             | 12.8  | 196.0                                    | 5,909.7          | 6,103.7        |
| Plumbers                                   | 0.0                              | 3.0                   | 2.0                         | 0.0                          | 0.0                        | 0.0                               | 0.0                | 0.1                | 0.7                     | 0.1                             | 0     | 6.0                                      | 51.5*            | 57.5           |
| Secretaries                                | 0.7                              | 6.2                   | 1.7                         | 2.7                          | 0.1                        | 1.7                               | 5.0                | 5.0                | 8.5                     | 0.1                             | 0.4   | 32.6                                     | 157.4            | 190.0          |
| Structural Construction Tradespersons      | 6.1                              | 45.6                  | 26.8                        | 78.3                         | 0.0                        | 0.1                               | 0.1                | 0.2                | 1.0                     | 0.0                             | 0.1   | 158.4                                    | 24.7             | 183.1          |
| Total Selected Occupations                 | 25.5                             | 168.2                 | 64.6                        | 142.5                        | 3.3                        | 19.6                              | 82.1               | 87.5               | 252.6                   | 1.9                             | 14.9  | 862.7                                    | 2,475.0          | 3,337.7        |
| Wood Tradespersons                         | 10.6                             | 0.8                   | 0.0                         | 0.6                          | 0.0                        | 0.0                               | 0.0                | 0.0                | 0.0                     | 0.0                             | 0     | 12.0                                     | 25.1             | 37.1           |
| All Occupations                            | 37.7                             | 189.2                 | 73.1                        | 152.6                        | 5.4                        | 28.5                              | 90.1               | 117.3              | 335.5                   | 4.9                             | 27.7  | 1,058.7                                  | 8,382.7          | 9,441.4        |

This distribution of occupations across industry sectors coupled with the forecast growth in these sectors enables estimates of future demand by relatively fine-grained occupation. Table 27 shows that these projections in final form. These projections are still defined in terms of occupational classification and what is therefore required to move from these projections to projections of the demand for qualifications is a mapping of these occupations onto qualifications.

Table 27: Employment Forecasts by Occupation<sup>12</sup>

| Occupation                          | Employment<br>2004-05 | Employment<br>forecast 2012-13 | Total change<br>2004-05 to 2012-13 | Average annual<br>change |
|-------------------------------------|-----------------------|--------------------------------|------------------------------------|--------------------------|
|                                     | Persons '000s         | Persons '000s                  | % change                           | % change                 |
| Architects & Landscape Arch         | 20.3                  | 23.9                           | 17.73%                             | 2.22%                    |
| Building & Construction Mgrs        | 54.6                  | 55.3                           | 1.28%                              | 0.16%                    |
| Building, Arch & Survey Assoc Prof. | 59.9                  | 70.8                           | 18.20%                             | 2.27%                    |
| Bricklayers                         | 28.7                  | 26.5                           | -7.67%                             | -0.96%                   |
| Cabinetmakers                       | 25.7                  | 23.5                           | -8.56%                             | -1.07%                   |
| Carpentry & Joinery Trades          | 112.7                 | 102.6                          | -8.96%                             | -1.12%                   |
| Cartographers & Surveyors           | 12.7                  | 15.1                           | 18.90%                             | 2.36%                    |
| Civil Engineers                     | 26.7                  | 26                             | -2.62%                             | -0.33%                   |
| Civic Engineering Assoc Prof.       | 5.7                   | 4.6                            | -19.30%                            | -2.41%                   |
| Cleaners                            | 215.8                 | 224.6                          | 4.08%                              | 0.51%                    |
| Concreters                          | 35                    | 41.2                           | 17.71%                             | 2.21%                    |
| Const'n/Plumber Assistants          | 44.4                  | 46                             | 3.60%                              | 0.45%                    |
| Crane, Hoist & Lift Operators       | 12.4                  | 15.6                           | 25.81%                             | 3.23%                    |
| Fibrous Plasterers                  | 26.8                  | 30.4                           | 13.43%                             | 1.68%                    |
| Floor Finishers                     | 11.6                  | 12.1                           | 4.31%                              | 0.54%                    |
| Garbage Collectors                  | 4                     | 4                              | 0.00%                              | 0.00%                    |
| Guards & Security Officers          | 40.4                  | 50.8                           | 25.74%                             | 3.22%                    |
| Handypersons                        | 35.8                  | 46.4                           | 29.61%                             | 3.70%                    |
| Insul'n & Home improve. Install     | 19.9                  | 24                             | 20.60%                             | 2.58%                    |
| Other Mine, Const'n Labour etc      | 12.6                  | 15.8                           | 25.40%                             | 3.17%                    |
| Painters & Decorators               | 44.1                  | 39.3                           | -10.88%                            | -1.36%                   |
| Plumbers                            | 56.8                  | 51.6                           | -9.15%                             | -1.14%                   |
| Property Professionals              | 13.6                  | 19.9                           | 46.32%                             | 5.79%                    |
| Quantity Surveyors                  | 2.7                   | 2.5                            | -7.41%                             | -0.93%                   |
| Real Estate Assoc Professionals     | 64.3                  | 73.9                           | 14.93%                             | 1.87%                    |
| Roof Slaters & tilers               | 10.1                  | 9.8                            | -2.97%                             | -0.37%                   |
| Signwriters                         | 7.1                   | 9.1                            | 28.17%                             | 3.52%                    |
| Solid Plasterers                    | 7.1                   | 8.9                            | 25.35%                             | 3.17%                    |
| Struc Steel Const'n Workers         | 16.9                  | 19.9                           | 17.75%                             | 2.22%                    |
| Survey Hands                        | 2.6                   | 3.2                            | 23.08%                             | 2.88%                    |
| Tilers and Stone masons             | 22                    | 25.3                           | 15.00%                             | 1.88%                    |
| <b>All occupations</b>              | <b>9799.7</b>         | <b>10951.2</b>                 | <b>11.75%</b>                      | <b>1.47%</b>             |

As already noted, these occupational projections to the year 2012-13 are based on *distributions* of occupations across industry from the year 2003-04. Clearly, if these distributions change significantly in the forecast period, this will introduce errors into the forecast of particular occupational growth. Furthermore this method does not allow for the introduction of new skills into the industry or allow for a change in any competencies associated with particular occupations or qualifications.

Our fundamental points in relation to the design of any such demand based forecasting systems are:

- there are limitations on the accuracy of this type of quantitative demand forecasting
- there are alternative methods which face different types of limitations
- the particular method that is used to best advantage for a particular industry will depend on a number of factors such as the complexity of its skill composition, with particular industry structure and the type of organisations within it and the quality of existing datasets about industry and occupational structure. The extent to which quantitative and qualitative methods are used may vary from industry to industry but the basic method will be common. Various industries and their associated ISCs will have varying levels of expertise and qualities of data and these differences will need to be accommodated within the method described.

### 3.5.12 Institutional arrangements

#### 3.5.12.1 The NSDC Data Cell (NDC)

A number of references have been made throughout this report to the proposed NDC. This organisation would have a central role in collecting, collating, managing and publishing data in the TVET data system.

Its core roles would be:

- to support the NSDC and ECNSDC in their policy and planning functions.
- to coordinate activities with other agencies such as BBS, BMET, BTEB and BANBEIS.

NDC will either have to acquire significant computing resources and expertise or sub-contract these functions to one of these other agencies. The preferred method will depend on funding and timelines. It is worth noting that in the Bangladesh environment attempting to build a new organisation with sufficient IT expertise is not without significant risks.

The data collection tasks for the NDC will include:

- Overseeing/executing the collection of TVET data as described in Section 3.2. This data may be collected by NDC exclusively or in association with existing organizations such as BTEB. Student data could continue to be collected directly by BTEB with the course and provider data being collected directly from providers. It would be compulsory for public providers and for affiliated private providers to submit their data.
- Private providers of non-affiliated courses should be strongly encouraged to provide data (if they cannot be compelled to do so). A range of incentives could be offered by NDC and the government more generally to encourage submissions of this data which should be in the same format as recommended in Section 3.2.

- Liaison with other agencies such as BBS and BMET to collect data describing overseas demand and changes in skill availability due to demographic factors – NDC will need to bring these data together in the format described in Section 3.5.5.
- Supervision of the ISCs - in particular, the NDC should oversee the work of their ISCs in gathering data on industry occupations and qualifications composition to ensure its consistency and accuracy. The NDC should assume an attitude of critical appraisal of the ISCs' data work and it should be empowered to influence composition of the ISCs' boards. The NDC should hold the ISCs accountable for the accuracy of the data they collect and the projections they make of future demand. One of the complexities which the ISCs will need to deal with effectively is lags in training times in the supply of new TVET graduates to industry. ISC planning needs to take account of the lag period in which new graduates will not come on stream for industry, in some cases, for three years after enrolment.

Overall, the NDC will need to develop a reputation as a reliable and trusted manager of the TVET data system and will need to be seen to deal without fear or favour with the industry ISCs. The NDC will be pivotal in implementing data related aspects of the work of the NSDC and will have a key role to play in brokering relationships between the NSDC and other agencies such as DTE, BTEB, BMET and BBS.

### **3.5.12.2 Industry Skill Councils (ISC)**

A central feature of an improved TVET data system in Bangladesh will be the establishment of ISCs for priority industries and eventually for all significant industries. These ISCs will have multiple functions including:

- build relationships with relevant employers and industry representative groups, with relevant ministries, and TVET institutions. This will be a critical factor in building trust and willingness to co-operate with the ISCs and the NSDC
- using employer and/enterprise surveys, build up detailed occupation and qualification matrices as described in Section 3.5.5
- assess and report regularly on skill gaps and emerging skill needs and assist employers and employer representative groups to formalise their skill requirements
- assist TVET institutions with the design of existing and new courses and qualifications
- in association with appropriate statistical agencies, conduct quantitative surveys of skills demand.

It is difficult to be definitive about the precise structure, representation and funding model for the ISCs. This is because there are major differences in the structure and numbers of participants across the industries that might be regarded as priority industries and because of differences in the skill needs of particular industries.

Also, we do not have a good understanding of the political environment for this type of organisation in Bangladesh. There are, however, several principles that should be applied to all of the ISCs:

- independence – each ISC should have a high degree of independence from their respective stakeholders in government, industry and the TVET sector and be able to make independent assessments and recommendations
- assured funding – each ISC should have assured funding over a three to five-year period so that longer term programmes can be confidently executed. In practice, the majority of funding will need to be from government but contributions from industry should also be required
- clearly defined and transparent key performance indicators (KPIs) – as the ISCs are set up in each industry their KPIs should be clearly defined and their achievement be regularly assessed and openly reported
- focus on building knowledge – ISCs should have a long-term focus on building knowledge about their industries and all dimensions of skills requirements and demand.

One of the central roles for the ISCs would be to build knowledge about their respective industries. We recommend that the ISCs undertake surveys in priority industries as described in Section 3.5.5. For consistency and accuracy these surveys should be undertaken under the supervision of NDC and preferably in association with BBS. Using results from these surveys BBS should develop more detailed data series of occupation and qualifications by industry and industry subsectors. BBS is well placed to provide technical expertise on survey techniques and could also undertake significant data processing tasks on behalf of the ISC and NDC. In undertaking this work each ISC should be empowered to collect more detailed information about its industry and that may be of interest to BBS for its national publications. Building up a detailed knowledge base, however, is a core task for each ISC and detailed industry specific data as well as qualitative information should be regarded as similarly valuable.

It will also be useful if data regarding pre-existing skill shortages and on-the-job training can be gathered on an industry specific basis by the ISCs but BBS should also consider the merits of aggregating this data for national publications.

## 3.6 Additional data to assist supply and demand analysis

So far we have focused on measures of the supply of or the demand for skills and qualifications. We have noted a number of definitional and conceptual challenges, for example, the ‘short side dominates’ problem. These challenges as well as the cost of data collection and issues with measurement accuracy contribute to the difficulty of comparing these supply and demand estimates to derive conclusive evidence of shortages or surpluses of particular types of skills. There are, however, a number of types of data which may indicate directly the presence or absence of shortages or surpluses and this section focuses on such data.

Although these data are not of themselves definitive in the sense that they can identify the magnitude of particular shortages or surpluses, they are nonetheless a valuable second reference or check on the results of any analysis that compares supply and demand. Such data can also help verify or dispute the claims of particular industries regarding the existence of shortages.

The main areas considered are student outcomes and vacancies data.

### 3.6.1 Student outcomes data

Student outcomes data, as the name suggests, is any data that enables a report of what students do following study, typically about the employment and occupational or study destinations of TVET graduates. This data might also include employer satisfaction with TVET training and/or extent to which employers use TVET graduates in preference to on the job training.

As noted above in Section 3.5.7.1 student outcomes data is also valuable for assessing the extent of existing skill shortages.

#### 3.6.1.1 What are the benefits of collecting these data?

The potential benefits of collecting student outcomes data are:

- data on student outcomes can assist in supply and demand matching by providing useful data on demand. For example, if students with a particular qualification become employed very quickly on relatively good incomes we can conclude that demand for this skill is high, and vice versa
- student outcomes data is particularly useful for helping prospective students make better training and career choices
- student outcomes data are clearly useful to TVET institutions in terms of enabling them to direct students into courses that result in successful employment outcomes. This is especially the case in the context of providers having greater autonomy over course options and program management
- consolidated student outcomes data is a necessary component for building better knowledge in the long run about skill markets and their dynamics.

#### 3.6.1.2 Where might this data come from?

Most stakeholders interviewed for this project reported that outcomes data is generally not available. There were, however, a few examples of training providers taking the initiative and conducting follow-up surveys by telephone of student destinations. Alumni sometimes also help in ascertaining such information. Consultations indicate that BTEB conducted 'tracer studies' in 1987/88 and 1995 but these were focused exclusively on students who found employment and so they do not enable any statistical conclusions to be drawn about outcomes generally.

ILO (2008: 77 – 80) provides some tables showing existing data but these are limited and relatively rudimentary and certainly do not provide sufficient detail for analysis for policy formation or management.

Basically there are two methods by which outcomes data about students can be captured by:

- survey
- using a system of unique student identifiers assigned to students upon enrolment with a TVET provider. These identifiers allow student progress to be tracked through the workforce. While this method is used in Sweden and Norway it can raise privacy issues and therefore this approach may not be suitable in all countries.

In the case of assessments of outcomes from the employer perspective it is necessary to conduct statistically valid surveys in order to derive quantitative results. Qualitative data in the area of employer assessment of TVET training are also potentially valuable but there is limited potential to infer characteristics of the entire population from this source.

### **3.6.1.3**

#### **Institutional arrangements**

In the absence of a unique identifier system, student outcome data is best collected by survey. This is potentially expensive and therefore the issue of who undertakes such survey work may be contentious. The method for undertaking the survey – by phone, via internet, by post – also needs to be determined.

In Australia the Student Outcomes Survey is an annual survey undertaken by NCVER. It covers students who have an Australian address as their usual address and are awarded a qualification (graduates) or who successfully complete part of a course and then leave the VET system (module completers). Students who undertake recreational, leisure or personal enrichment (short) courses are excluded. The survey is conducted by post six months after completion of the qualification.

In Bangladesh a postal survey is probably not viable and the main method that is likely to be successful is mobile phone interview or possibly Internet based survey – to some extent mobile phone numbers and e-mail addresses are relatively persistent unique identifiers. When it comes to the question of who should conduct such surveys there is an argument for each TVET institution following up its own students. It is in the interests of institutions to understand outcomes of their particular students rather than just having access to the aggregate outcomes data that would be published as an output of such a survey at the national level. However if TVET institutions conduct their own surveys it is possible they may apply inconsistent collection methods or introduce bias in sampling and/or reporting. Therefore it may be preferable to assign this task to a central statistical organisation. We recommend that NDC be responsible for overseeing the collection of outcomes data. Some of the actual collection may be devolved to particular TVET institutions under the direction of NDC or if a central approach is preferred, BBS could be involved in the execution of the surveys. This type of arrangement would also suit the conduct of an employer survey of VET outcomes.

In Australia NCVER conducts the survey Employers' use and views of the VET system.

The survey is a random stratified sample and is conducted regularly, last conducted in 2007, previously in 2001 and 2005 and before then on a biennial basis back to 1995. The survey is delivered by telephone interview.

*This survey collects information about employers' use and views of the vocational education and training (VET) system and the various ways employers use the VET system to meet their skill needs. Information collected is designed to measure the awareness, engagement and satisfaction of employers with the VET system.<sup>13</sup>*

#### 3.6.1.4 Data types

The following table indicates the types of data that would be collected from students and employers.

**Table 28: Student and employer outcomes data types**

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Impact on students  | Student employment outcomes and satisfaction with VET <ul style="list-style-type: none"> <li>- type of training undertaken</li> <li>- institution where training undertaken</li> <li>- employed, unemployed, further study</li> <li>- if employed, time taken to gain employment</li> <li>- match between qualification and occupation</li> <li>- industry employed in</li> <li>- full job title</li> <li>- income</li> <li>- satisfaction with training</li> <li>- job-related benefits of training</li> </ul>              |
| Impact on employers | Employer engagement and satisfaction with TVET <ul style="list-style-type: none"> <li>- location</li> <li>- type of business, industry</li> <li>- size of business</li> <li>- occupational categories employed</li> <li>- extent of on-job and/or formal training</li> <li>- employment of TVET graduates</li> <li>- type of qualifications employed</li> <li>- importance of formal qualification</li> <li>- numbers of employees with formal qualifications</li> <li>- employer satisfaction with TVET training</li> </ul> |

This is a proposed dataset where importantly stakeholders have the opportunity to propose additional data types that might be collected. A particular instance of a student survey is presented below.

Our recommendation is that a student survey be established and that an employer survey be considered for the future.

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<sup>13</sup> <http://www.ncver.edu.au/statistic/21066.html> (accessed 29/12/09)

## Student Outcome File (NDC250)

### Definition

The Student Outcome File (NDC250) contains a record for outcomes of students reported in the Qualification Completed File (NDC 100) and who have returned a survey form. Optionally, over time NDC may wish to survey students reported as undertaking a course in the Enrolment File (NDC 050) but who failed or did not complete their course to understand the pathway they subsequently followed.

### Context

The Student Outcome File (NDC250) provides information about students who have returned a survey once they have completed their training. The survey is usually conducted from 6 months to one year of completion to allow the student to find employment or further study.

**Table 29: Student Outcome File**

| Student Outcome File (NDC250) Field table |                                                                                                                  |                             |                      |                                                                                            |
|-------------------------------------------|------------------------------------------------------------------------------------------------------------------|-----------------------------|----------------------|--------------------------------------------------------------------------------------------|
| Field number                              | Fields                                                                                                           | Currently Collected by BTEB | Variables            | Comment                                                                                    |
| NDC010-01                                 | Training Organisation Identifier                                                                                 | Y (Part)                    | Up to 10 digits      | Found in the TRAINING PROVIDER FILE (NDCB010)                                              |
| NDC020-01                                 | Client Identifier                                                                                                | YU                          |                      | Found in the CLIENT FILE (NDCB020) FIELD TABLE                                             |
| NDC030-01                                 | Qualification/Course Identifier                                                                                  | Y                           |                      | Found in the CURRICULUM FILE (NDCB030)                                                     |
| NDC250-01                                 | Enrolment Activity Start Date                                                                                    | U                           | DD/MM/YYYY           | For the course being surveyed                                                              |
| NDC250-02                                 | Enrolment Activity End Date                                                                                      | U                           | DD/MM/YYYY           | For the course being surveyed                                                              |
| NDC250-10                                 | Are you enrolled in any other training?                                                                          | U                           | Y/N                  | Provides information about whether the client is undertaking further training              |
| NDC250-11                                 | What was your occupation of your main job at date xx (ie 6-12 months after completing training)                  | U                           | Up to 6 digits       | To be classified to the relevant BSCO by a skilled coder when entering student survey data |
| NDC250-12                                 | What were the main tasks you usually performed?                                                                  | U                           | Up to 100 characters | Descriptive field - This is a cross check to ensure the occupation is correctly classified |
| NDC250-13                                 | What industry are you currently employed in?                                                                     | U                           | 6 digits             | The interviewer would guide the interviewee to the appropriate industry classification     |
| NDC250-14                                 | What is your average weekly wage?                                                                                | U                           | 6 digits             | In Taka. Interviewer provides range                                                        |
| NDC250-15                                 | How long did it take you to find a job after you completed your training?                                        | U                           | 3 digits             | Weeks after training completed                                                             |
| NDC250-16                                 | How many jobs did you apply for between completing your training and obtaining your current job?                 | U                           | 3 digits             | Number of applications by client                                                           |
| NDC250-17                                 | What paid job did you hold during the six months before undertaking the training for which this survey was sent. | U                           | Up to 6 digits       | By BSCO classification. To determine progression as a result of training.                  |
| NDC250-18                                 | What industry were you employed in this period?                                                                  | U                           | 6 digits             | The interviewer would guide the interviewee to the appropriate industry classification     |
| NDC250-19                                 | What was your average weekly wage?                                                                               | U                           | 6 digits             | In Taka. Interviewer provides range                                                        |

Legend Y – Currently collected by BTEB; N – Not currently collected; U - Uncertain

These fields represent a recommended minimum set and focuses on the need in Bangladesh to use the student outcomes survey as a means to check on the state of skill shortages for particular qualifications, for example, if many students with a particular qualification remain unemployed for a significant time then claims of a 'skill shortage' for that particular qualification are unlikely to be warranted. However, such a survey could also be expanded to assess the views of students of satisfaction with the course material and suitability to current employment (see, for example, Attachment 2).

### 3.6.1.5 Data presentation

Again, there are many options for presenting these data, with many possible types of cross tabulations.

Table 30: Key findings for graduates and module completers, 2008

|                                                                                 | Graduates<br>% | Module completers<br>% |
|---------------------------------------------------------------------------------|----------------|------------------------|
| <b>Employment and further study outcomes</b>                                    |                |                        |
| <i>After training (as at 30 May 2008)</i>                                       |                |                        |
| Employed                                                                        | 80.7           | 76.9                   |
| Not employed <sup>1</sup>                                                       | 19.3           | 23.1                   |
| Unemployed                                                                      | 9.2            | 9.0                    |
| Not in the labour force                                                         | 9.7            | 13.4                   |
| Employed before training                                                        | 74.0           | 75.0                   |
| Difference in proportion employed from before training to after                 | 6.7            | 1.9                    |
| Not employed before commencing the training and employed after                  | 12.5           | 8.3                    |
| Employed in first full-time job after training <sup>2</sup>                     | 17.1           | 14.1                   |
| Employed or in further study after training <sup>2,3</sup>                      | 89.1           | 79.3                   |
| Enrolled in further study after training <sup>2,3</sup>                         | 32.8           | 4.0                    |
| Studying at university <sup>2</sup>                                             | 6.9            | 4.0                    |
| Studying at TAFE institute <sup>2</sup>                                         | 17.8           | na                     |
| Studying at private provider or other registered provider <sup>2</sup>          | 7.8            | na                     |
| <b>Training</b>                                                                 |                |                        |
| <i>Reasons for undertaking the training</i>                                     |                |                        |
| Employment-related outcome                                                      | 77.6           | 68.8                   |
| Further study outcome                                                           | 4.5            | 2.2                    |
| Personal development outcome                                                    | 17.8           | 29.0                   |
| Training was part of an apprenticeship or traineeship <sup>2</sup>              | 25.7           | 9.0                    |
| <b>Satisfaction outcomes</b>                                                    |                |                        |
| Satisfied with the overall quality of training                                  | 89.0           | 85.5                   |
| Fully or partly achieved their main reason for doing the training               | 87.9           | 82.0                   |
| <b>Benefits of training</b>                                                     |                |                        |
| <i>Of those employed at May 2008</i>                                            |                |                        |
| Reported that the training was highly or somewhat relevant to their current job | 75.5           | 61.6                   |
| Received at least one job-related benefit                                       | 73.0           | 54.0                   |

Table 30 shows outcomes for graduates and module completers from the Australian VET system and includes subjective data on satisfaction with training and relevance to current job. This is an example of the type of output table that could be produced based on the data collected for the student outcome survey.

Table 31 gives student outcomes categorised by type of course undertaken and this data is of particular relevance to prospective students in that it enables them to evaluate the levels of employment associated with different qualifications. Again there is a significantly more detail in these tables than is available from the current data in Bangladesh. It is important to emphasise, however, that time series unit record data is maintained and this represents a very rich data source for researchers and deeper analysis for policy purposes.

**Table 31: Findings for graduates by various training characteristics, 2008**

|                                                              | Employed after training | Difference in proportion employed from before training to after | Employed or in further study | Fully or partly achieved their main reason for doing the training | Satisfied with the overall quality of training |
|--------------------------------------------------------------|-------------------------|-----------------------------------------------------------------|------------------------------|-------------------------------------------------------------------|------------------------------------------------|
|                                                              | %                       | %                                                               | %                            | %                                                                 | %                                              |
| <b>Field of education</b>                                    |                         |                                                                 |                              |                                                                   |                                                |
| Natural and physical sciences                                | 73.6                    | 11.0                                                            | 94.0                         | 82.4                                                              | 93.8                                           |
| Information technology                                       | 64.3                    | 14.1                                                            | 83.8                         | 79.7                                                              | 87.2                                           |
| Engineering and related technologies                         | 89.8                    | 7.5                                                             | 92.6                         | 90.7                                                              | 89.1                                           |
| Architecture and building                                    | 89.8                    | 12.9                                                            | 94.0                         | 92.6                                                              | 89.1                                           |
| Agriculture, environmental and related studies               | 84.5                    | 4.3                                                             | 91.0                         | 90.4                                                              | 90.2                                           |
| Health                                                       | 89.0                    | 4.3                                                             | 93.3                         | 91.1                                                              | 87.7                                           |
| Education                                                    | 91.8                    | 2.5                                                             | 94.4                         | 87.6                                                              | 84.5                                           |
| Management and commerce                                      | 78.7                    | 3.8                                                             | 88.9                         | 84.6                                                              | 88.3                                           |
| Society and culture                                          | 81.5                    | 10.5                                                            | 89.6                         | 89.4                                                              | 90.5                                           |
| Creative arts                                                | 61.7                    | -2.4                                                            | 84.0                         | 81.4                                                              | 86.1                                           |
| Food, hospitality and personal services                      | 79.0                    | 7.4                                                             | 86.0                         | 88.5                                                              | 90.2                                           |
| Mixed field programs                                         | 54.0                    | 12.1                                                            | 75.3                         | 87.7                                                              | 90.4                                           |
| <b>Qualification</b>                                         |                         |                                                                 |                              |                                                                   |                                                |
| Diploma and above                                            | 84.7                    | 3.1                                                             | 93.2                         | 85.8                                                              | 85.0                                           |
| Certificate IV                                               | 84.7                    | 1.0                                                             | 93.7                         | 86.6                                                              | 86.6                                           |
| Certificate III                                              | 86.0                    | 9.0                                                             | 91.5                         | 90.9                                                              | 89.2                                           |
| Certificate II                                               | 73.1                    | 7.0                                                             | 83.1                         | 85.7                                                              | 91.1                                           |
| Certificate I                                                | 61.0                    | 13.7                                                            | 76.3                         | 85.5                                                              | 92.9                                           |
| <b>Training was part of an apprenticeship or traineeship</b> |                         |                                                                 |                              |                                                                   |                                                |
| Yes                                                          | 89.2                    | 11.3                                                            | 93.2                         | 94.3                                                              | 87.7                                           |
| No                                                           | 77.8                    | 4.7                                                             | 87.7                         | 85.5                                                              | 89.2                                           |
| <b>Reasons for undertaking the training</b>                  |                         |                                                                 |                              |                                                                   |                                                |
| Employment-related outcome                                   | 85.6                    | 7.1                                                             | 91.8                         | 86.3                                                              | 88.9                                           |
| Further study outcome                                        | 61.3                    | 0.8                                                             | 90.4                         | 91.1                                                              | 88.7                                           |
| Personal development outcome                                 | 65.1                    | 6.0                                                             | 78.5                         | 93.1                                                              | 88.8                                           |
| <b>All graduates</b>                                         | <b>80.7</b>             | <b>6.7</b>                                                      | <b>89.1</b>                  | <b>87.9</b>                                                       | <b>89.0</b>                                    |

Table 32 shows data on the relevance of training to graduates' destination occupation. This type of data is particularly valuable for demand assessment and policy formation purposes.

**Table 32: Occupational destination and training relevance for graduates<sup>2</sup> by various training characteristics, 2008**

|                                                              | Employed                                                   |                                                              |                                                                                  |            | Total employed <sup>6</sup> | Not employed <sup>1</sup> | Total      |
|--------------------------------------------------------------|------------------------------------------------------------|--------------------------------------------------------------|----------------------------------------------------------------------------------|------------|-----------------------------|---------------------------|------------|
|                                                              | In same occupation group <sup>5</sup> (as training course) | In different occupation group (to training course)           | Occupation after training not known                                              |            |                             |                           |            |
|                                                              | %                                                          | Training was highly or somewhat relevant to current job<br>% | Training was of very little relevance or not at all relevant to current job<br>% | %          | %                           | %                         | %          |
| <b>Intended occupation of training activity<sup>5</sup></b>  |                                                            |                                                              |                                                                                  |            |                             |                           |            |
| Managers                                                     | 10.7                                                       | 54.4                                                         | 15.6                                                                             | 1.6*       | 82.2                        | 17.8                      | 100        |
| Professionals                                                | 20.7                                                       | 40.4                                                         | 21.4                                                                             | 0.6*       | 83.1                        | 16.9                      | 100        |
| Technicians and trades workers                               | 54.2                                                       | 21.7                                                         | 11.2                                                                             | 1.1        | 88.1                        | 11.9                      | 100        |
| Community and personal service workers                       | 37.4                                                       | 22.1                                                         | 19.3                                                                             | 0.9        | 79.9                        | 20.1                      | 100        |
| Clerical and administrative workers                          | 13.5                                                       | 41.4                                                         | 17.0                                                                             | 1.3        | 73.4                        | 26.6                      | 100        |
| Sales workers                                                | 36.3                                                       | 33.1                                                         | 13.9                                                                             | 1.0*       | 84.5                        | 15.5                      | 100        |
| Machinery operators and drivers                              | 22.7                                                       | 51.9                                                         | 18.0                                                                             | 1.8*       | 94.4                        | 5.6                       | 100        |
| Labourers                                                    | 21.8                                                       | 38.3                                                         | 19.5                                                                             | 1.2*       | 81.0                        | 19.0                      | 100        |
| <b>Training was part of an apprenticeship or traineeship</b> |                                                            |                                                              |                                                                                  |            |                             |                           |            |
| In a trade occupation course <sup>7</sup>                    | 78.9                                                       | 10.5                                                         | 3.9                                                                              | 0.6*       | 93.9                        | 6.1                       | 100        |
| In a non-trade occupation course                             | 37.6                                                       | 37.7                                                         | 11.4                                                                             | 0.8*       | 87.7                        | 12.3                      | 100        |
| <b>All graduates<sup>8</sup></b>                             | <b>30.3</b>                                                | <b>33.8</b>                                                  | <b>16.8</b>                                                                      | <b>1.1</b> | <b>82.1</b>                 | <b>17.9</b>               | <b>100</b> |

Table 33 is from the employer survey and illustrates the level of detail available in the survey publication report. The usefulness of this data in assisting the estimation of the demand for skills is discussed below in Section 3.6.4.

**Table 33: Use of training in the last 12 months by employer characteristics, 2007 and 2009 (%)**

| Employer characteristics                        | Employers using the VET system |       | Employers using unaccredited training |       | Employers using informal training |      | Employers providing no training |       |
|-------------------------------------------------|--------------------------------|-------|---------------------------------------|-------|-----------------------------------|------|---------------------------------|-------|
|                                                 | 2007                           | 2009  | 2007                                  | 2009  | 2007                              | 2009 | 2007                            | 2009  |
| State                                           |                                |       |                                       |       |                                   |      |                                 |       |
| (Base: all employers within state)              |                                |       |                                       |       |                                   |      |                                 |       |
| New South Wales                                 | 56.2                           | 58.3  | 50.8                                  | 49.9  | 73.4                              | 77.0 | 11.6                            | 8.0   |
| Victoria                                        | 54.4                           | 57.5  | 44.7                                  | 53.1  | 68.9                              | 76.6 | 16.0                            | 10.1  |
| Queensland                                      | 51.2                           | 54.4  | 48.0                                  | 53.5  | 70.2                              | 77.7 | 14.4                            | 9.5   |
| South Australia                                 | 49.8                           | 53.0  | 48.5                                  | 54.9  | 68.4                              | 75.5 | 16.8                            | 11.0  |
| Western Australia                               | 52.4                           | 56.3  | 55.3                                  | 56.7  | 69.8                              | 74.4 | 14.1                            | 10.4  |
| Tasmania                                        | 57.2                           | 54.2  | 48.9                                  | 53.5  | 70.0                              | 76.8 | 13.4                            | 10.6  |
| Northern Territory                              | 52.7                           | 62.9  | 54.3                                  | 58.6  | 79.2                              | 83.6 | 7.7*                            | 7.6*  |
| Australian Capital Territory                    | 54.4                           | 54.1  | 54.5                                  | 57.6  | 78.1                              | 81.0 | 11.9                            | 8.6   |
| Employer size                                   |                                |       |                                       |       |                                   |      |                                 |       |
| (Base: all employers within employer size)      |                                |       |                                       |       |                                   |      |                                 |       |
| Small                                           | 45.7                           | 49.1  | 41.8                                  | 44.5  | 64.8                              | 72.2 | 17.9                            | 12.4  |
| Medium                                          | 75.1                           | 74.6  | 66.5                                  | 72.3  | 87.3                              | 88.5 | 2.8*                            | 1.3*  |
| Large                                           | 95.1                           | 96.7  | 91.2                                  | 95.1  | 95.6                              | 92.7 | **                              | **    |
| Industry                                        |                                |       |                                       |       |                                   |      |                                 |       |
| (Base: all employers within industry)           |                                |       |                                       |       |                                   |      |                                 |       |
| Agriculture, forestry and fishing               | 29.1                           | 27.0  | 32.7                                  | 32.6  | 52.9                              | 58.6 | 25.6                            | 24.7  |
| Mining                                          | 82.7                           | 59.1  | 46.0*                                 | 69.6  | 88.2                              | 58.0 | 4.3*                            | 7.7*  |
| Manufacturing                                   | 58.2                           | 65.4  | 48.0                                  | 49.9  | 74.3                              | 72.7 | 12.2*                           | 10.2  |
| Electricity, gas, water and waste services      | 31.0*                          | 30.1* | 33.9*                                 | 54.6* | 86.8                              | 77.4 | **                              | **    |
| Construction                                    | 78.0                           | 79.0  | 35.6                                  | 44.5  | 73.2                              | 75.5 | 8.8*                            | 6.5   |
| Wholesale trade                                 | 41.7                           | 42.6  | 44.2                                  | 43.9  | 65.6                              | 75.0 | 17.1*                           | 10.5* |
| Retail trade                                    | 44.0                           | 45.2  | 45.4                                  | 58.3  | 67.2                              | 80.1 | 17.7                            | 9.8   |
| Accommodation and food services                 | 49.6                           | 42.3  | 36.6                                  | 43.6  | 75.9                              | 81.1 | 17.3*                           | 11.5* |
| Transport, postal and warehousing               | 46.9                           | 36.0  | 49.6                                  | 57.6  | 71.9                              | 80.7 | 21.0                            | 10.8* |
| Information media and telecommunications        | 35.0                           | 40.0* | 41.4                                  | 53.5  | 66.2                              | 84.9 | 26.8*                           | **    |
| Financial and insurance services                | 68.4                           | 62.7  | 73.1                                  | 65.3  | 80.7                              | 77.1 | 6.2*                            | 9.9*  |
| Rental, hiring and real estate services         | 49.9                           | 68.9  | 59.0                                  | 55.6  | 72.1                              | 61.5 | 12.3                            | 11.1* |
| Professional, scientific and technical services | 44.5                           | 54.5  | 53.4                                  | 56.9  | 68.2                              | 79.8 | 26.2*                           | 6.0*  |
| Administrative and support services             | 43.1*                          | 45.8  | 44.7*                                 | 68.1  | 83.2                              | 90.2 | **                              | 5.8*  |
| Public administration and safety                | 90.9                           | 68.0  | 90.3                                  | 58.1  | 90.1                              | 82.6 | **                              | **    |
| Education and training                          | 63.8                           | 70.2  | 67.9                                  | 68.2  | 74.8                              | 78.0 | 10.0*                           | 5.1*  |
| Health care and social assistance               | 57.7                           | 62.1  | 59.4                                  | 64.8  | 72.2                              | 86.3 | 6.0*                            | 7.3*  |
| Arts and recreation services                    | 45.0                           | 47.2  | 45.7                                  | 53.6  | 73.4                              | 75.5 | 16.9*                           | 12.3* |
| Other services                                  | 73.1                           | 73.1  | 52.3                                  | 46.9  | 70.2                              | 73.5 | 9.9*                            | 9.1*  |
| Total                                           | 54.0                           | 56.7  | 49.0                                  | 52.7  | 71.0                              | 76.8 | 13.9                            | 9.3   |

### 3.6.2 Job vacancies

Job vacancies, especially hard to fill job vacancies, are an important independent indicator of the level of demand for particular qualifications or skill groups. A number of factors, however, make job vacancies another difficult variable to quantify. For example, employers may advertise positions in several media or they may neglect to remove advertised places once they have been filled.

In Australia, The Department of Education, Employment and Workplace Relations (DEEWR) conducts a monthly survey of vacancies, 'Survey of employers who have recently advertised' (SERA). It makes the comment that:

*SERA results are not intended as a measure of the degree of shortage and are not statistically accurate. Reflecting this, figures are quoted in the relevant skill shortage report in broad terms, but may be compared with previous results when available. The SERA is only one piece of evidence for the state of the labour market for a particular occupation. While it may vary from occupation to occupation, other relevant information including that outlined under 'demand analysis' and 'supply analysis', and SERA results are interpreted in light of other available information such as employment growth, vacancy trends (where reliable) and the comments of employers, industry contacts, educational institutions and labour market intermediaries.<sup>14</sup>*

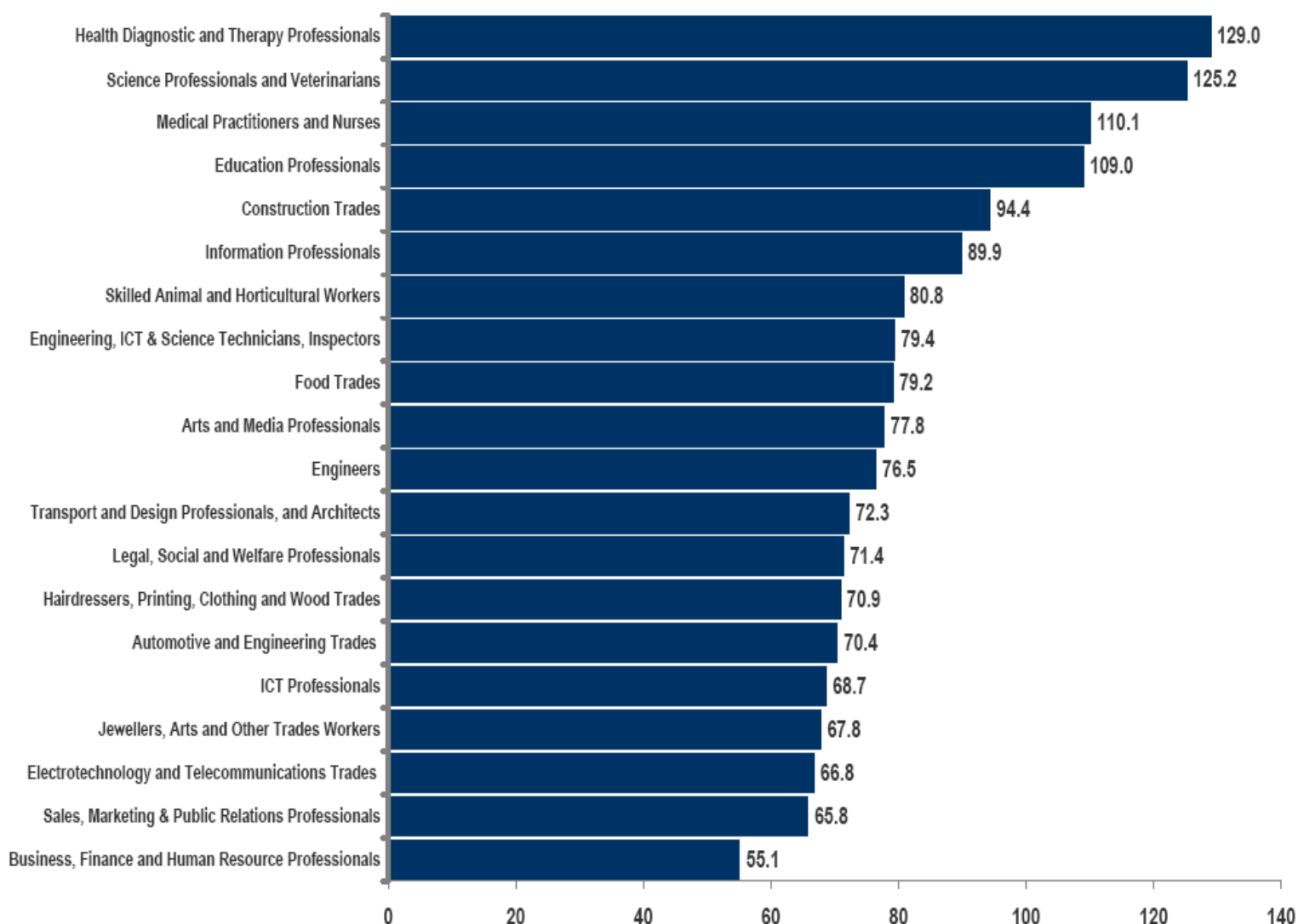
**Table 34: Internet Vacancy Index— Occupational and Regional Summary Table**

|                                        | Index<br>Jan-10 | % change    |              | No of Vacancies<br>Jan-10 |
|----------------------------------------|-----------------|-------------|--------------|---------------------------|
|                                        |                 | Monthly     | Annual       |                           |
| Managers                               | 78.0            | -0.9        | -24.4        | 21,124                    |
| Professionals                          | 71.9            | -3.7        | -33.2        | 45,690                    |
| Technicians and Trades Workers         | 76.5            | -3.1        | -18.2        | 22,414                    |
| Community and Personal Service Workers | 82.8            | -5.9        | -8.0         | 11,968                    |
| Clerical and Administrative Workers    | 55.9            | -0.7        | -17.9        | 29,570                    |
| Sales Workers                          | 67.2            | -5.1        | -13.6        | 19,214                    |
| Machinery Operators and Drivers        | 64.8            | -6.6        | -11.1        | 8767                      |
| Labourers                              | 53.9            | -6.5        | -17.4        | 16,614                    |
| <b>States and Territories</b>          |                 |             |              |                           |
| New South Wales                        | 60.6            | -2.1        | -18.1        | 58,794                    |
| Victoria                               | 66.8            | -5.1        | -17.2        | 42,517                    |
| Queensland                             | 63.7            | -4.7        | -32.6        | 34,738                    |
| South Australia                        | 76.2            | -3.8        | -15.7        | 10,683                    |
| Western Australia                      | 85.5            | -1.7        | -28.6        | 17,988                    |
| Tasmania                               | 77.8            | -1.7        | -14.8        | 2587                      |
| Northern Territory                     | 121.0           | -5.6        | -4.6         | 3075                      |
| Australian Capital Territory           | 121.1           | -3.2        | -20.2        | 4979                      |
| <b>Australia</b>                       | <b>67.4</b>     | <b>-3.5</b> | <b>-22.1</b> | <b>175,362</b>            |

Table 34 and Table 35 illustrate the presentation of information available from the SERA survey. The fact that vacancy data are presented as indexes is instructive: the data are not accurate enough to enable interpretations of absolute shortages; rather the indexes enable comparisons of relative levels of vacancies and changes in these over time.

<sup>14</sup> SKILL SHORTAGE METHODOLOGY 2008-09, The Department of Education, Employment and Workplace Relations (DEEWR),

**Table 35: Internet Vacancy Index— Occupational and Regional Summary Table**



We recommend that NDC co-operate with BBS to develop a vacancy index similar to the SERA index. The method for collecting data is via telephone survey of employers who advertise via newspapers and the Internet. The occupations, regions and industries would need to be customised for Bangladesh. We would recommend beginning with priority industries and/or those industries where it was expected there might be significant shortage.

The movement in index values over time would provide additional insight into the extent of skills and qualifications shortages that would supplement the data generate by the other approaches described above.

### 3.6.3 Hiring surveys

Another approach to assessing skill and qualifications demand conditions is to survey directly employers on their 'hiring intentions'. Such a survey is not recommended in the context of this report. The main reasons for not recommending are:

- costs of surveying in relation to resource limitations
- the fact that other surveys are proposed that serve some of the functions of a hiring intentions survey
- the problem that employers have clear incentives to overstate hiring intentions especially when they know that such surveys are linked to skill and qualifications training budgets.

### 3.6.4 What can student outcomes, employer surveys and vacancy data tell us about the demand for skills?

In Section 3.5.7.1 we indicated that student outcomes and vacancy data is useful in assessing the veracity of industry claims regarding skill shortages or indication of shortages that emerge from demand and supply analysis.

It is not possible, or at least feasible, to collect student outcomes or vacancy data in such a way that quantitative results can be directly fed into a model of the demand for skills. Student outcomes and vacancy data can be used to provide a 'reality check' on claims about skill shortages made by industry.

If, in a particular qualification group, many students are unable to get a job that matches their qualification and they get jobs only after much searching and, in addition, unfilled vacancies in that qualification group are relatively low, then the ISCs and NDC should be very sceptical about claims of skill shortage for these qualification groups.

Thus, data about student outcomes and vacancies would be relevant in the process of dialogue and review between industry, ISC and NDC. For example, the NDC might advise that claims of skill shortages for particular qualifications in particular industries are not sustainable because student outcomes data shows that there is significant unemployment in those qualification groups. In such cases the ISCs would be required to revise downwards final estimates of skill shortages and therefore the extent to which they were manifested in projections of future skills and qualifications demand.

Employer survey data such as reported in Table 33 enable judgements to be made about the extent to which graduates from the TVET system are actually used and/or preferred by employers. This is important for understanding the need to modifying courses to meet employer needs and to understand why there may be some unemployment among graduates even if the demand for their types of skills is relatively high.

## 4 Implementation

The proposal contained in this report sets out the required data and methods of analysis to strengthen the TVET and skills data system in Bangladesh. Recommendations on institutional arrangements have also been made that take account of existing capacity and emerging structures. However implementation of the proposed data model is contingent on a number of factors unknown at this stage and outside the control of the TVET Reform Project. Chief amongst those is the future status and operational capacity of the NSDC Secretariat and the proposed National Data Cell (NDC). Another key unknown at this stage is the status of the National Skills Development Policy which commits to a strengthened data system and enshrines the future data roles of ISC. Without these key issues addressed in a concrete way, detailed work on an implementation plan is considered premature.

In Section **Error! Reference source not found.** the report described hardware and software systems used by existing organisations involved in the collection and management of educational, labour force and skills data.

These systems indicate the type of hardware and software that would be required if the NDC were setting up for operation in the immediate future. We believe, however, that specifying hardware and software systems for the NDC at this point in time would be significantly premature and inappropriate. As we have discussed (see Recommendation 3), we believe that, in the first instance at least, the NDC should outsource data collection and management to experienced organisations. The cost and risk associated with setting up a significant data collection and management capability from scratch should not be underestimated, especially in Bangladesh. Our consultations suggest that resources and skills in this area are limited and that the time required to identify and appoint personnel can be inordinately great.

It may well be that the NDC's data requirements can be managed by an outsourcing organisation without any significant increase in a hardware and software resources. It eventually NDC brings data collection and management into an internal IT group this may be as much as 5 to 10 years in the future and any hardware software specifications made at this time will certainly be obsolete by that time.

A related implementation issue is the question of how often the proposed enterprise employer survey should be undertaken. Again, we are unable to make a specific recommendation on the basis of information to hand. In Recommendation 10 we have suggested that a regular survey every 2 to 5 years would be appropriate. Ultimately this will depend upon a number of factors which are unknown at this point in time. Central of these is the level of resources devoted to the effort. In addition, much will depend on the outcome of and lessons learned from surveys in the initial priority industries. Surveying these industries for the more detailed data discussed in this report will inevitably involve some 'learning by doing'. The lessons of this experience will need then to be incorporated into subsequent more economy-wide surveys.

## 5 Matching skills demand and supply: an alternative approach

Up to this point we have discussed various data types and methods that are focused primarily on quantitative demand projection for the purposes of implementing a central planning solution that matches the output of the TVET sector to projected demand.

Throughout this discussion we have emphasised challenges and limitations associated with this approach and have also provided an assessment of the status of this approach in other jurisdictions. In summary, whereas this approach can yield useful broad data that assists in planning and policy formation, it is nonetheless relatively expensive to apply, yields error prone results and requires a considerable accumulation of historical data of significant accuracy before it begins to yield reliable results.

We have also discussed the fact that there are other data sources that are useful in forming a view about skills demand conditions in various industries. These include:

- TVET graduate outcomes
- Student applications data
- Duration and numbers of vacancies.

Given the complexity and dynamism of the TVET sector the ability of formulaic or algorithm single methodologies to provide consistently reliable results is limited. Throughout the discussion we have emphasised the central role of ISCs in building knowledge about their industries and the benefit of collecting detailed data time series on which to base ongoing research effort also ultimately aimed at generating new knowledge about the system. Time is also required to build familiarity with these datasets and also deeper knowledge and expertise on the part of policymakers and researchers.

Whereas the example of other countries shows that this type of expertise can be built up, we believe it may be useful to suggest a more expedient solution in the case of Bangladesh that offers the prospect of useful results within a shorter timeframe. If it is determined that the resources to implement the approach specified in the body of the report are not available then this approach could be found to be attractive. It may be that this approach could be considered as a stepping stone to a more deterministic approach. We will describe this method as *The Expedient Planning Approach* (EPA). The EPA is described in the following steps including definition of institutions that are proposed to be responsible for decisions at each step.

- Step 1:** The MOE defines the annual TVET budget in a particular planning period, say, three years.
- Step 2:** The NSDC allocates this training budget between industries according to a set of criteria that includes contribution to the Bangladesh economy, level

of exports, level of employment etc . These criteria could be related in a formula which was published so that its application was transparent or the NSDC could be empowered to allocate the National TVET budget solely at its discretion (or in consultation with other ministries or agencies).

**Step 3:** Once the training budget for each industry was determined each ISC would be tasked with providing a recommended allocation of that budget to qualifications. For clarity, we emphasise that the budget for each industry and its corresponding ISC is *notional* - no funds are handed over to the ISCs – they are simply informed by the NSDC of their respective industry’s training budget for the coming year and they are required to recommend how that budget should be allocated across the skills and qualifications that are relevant to their industry.

This specification would not define which TVET providers should produce these skills but would simply define a target output of skills relevant to that industry. This budgeting or allocation process would include consideration of the cost of each type of qualification. Estimates of the cost of producing each type of qualification would need to be as accurate as possible but absolute accuracy would not be necessary. It would be in the interests of each industry and ISC to improve their estimates of the cost of producing each skill and qualification over time in order to achieve more cost effective planning. Each ISC would be expected to consult extensively with employer groups and employers themselves in making the budget recommendations. In addition, each ISC, at least those in priority industries, should be resourced to undertake statistically significant surveys of skill requirements within their industry, potentially in association with organisations such as BBS. BMET would similarly be tasked to allocate a budget for the training of overseas workers

**Step 4:** Each ISC and BMET would then submit their proposed skill/qualification budget allocations to the NSDC which would aggregate across all industries creating a national set of qualifications output targets for the next year. NSDC would critically review these budgets and, in particular, would conduct student outcomes surveys to ascertain whether graduates who have completed qualifications that are in areas of high demand as identified by the ISCs have or have not quickly obtained employment. NSDC should be empowered to modify the budget submissions of the ISCs on the basis of their analysis.

**Step 5:** This set of qualifications targets would then be passed to DTE for allocation of training budgets to specific TVET providers.

This approach focuses on the provision of training by public TVET providers. The likely training output of private providers would need to be taken into account by NSDC and DTE in setting the qualifications output targets for public institutions. An indication of the likely output of private providers, at least in the formal sector, would be their output of qualifications in the preceding year. Alternatively, the public and private TVET

providers could be invited to tender competitively for the provision of the desired qualifications.

Our rationale for recommending this expedient approach is as follows:

- the information environment in Bangladesh particularly with respect to skills demand is poor
- given the low base in terms of data quality, achieving significant improvement will be relatively expensive and resources in Bangladesh are limited
- the level of knowledge about the intricacies of VET sector and the level of analytical capacity about the sector is relatively low and will take time to build
- the approach puts the onus on the group with most expertise about the skills needs of an industry—the ISCs—to review carefully where to allocate the training money for their industry. In doing so, they must weigh up competing claims, take account of the relative cost of courses, and recognize that more of one type of skill can only be obtained only if less of another type is provided (because of the budget constraint).
- the proposed method also removes any incentive for the ISCs to exaggerate the skill demands of their industries and focuses their attention on defining the best composition of skills for the industry within a given budget constraint.
- the views of stakeholders is that skills shortages are endemic in almost all industries of the Bangladesh economy and this means that the returns to fine tuning and detailed management are relatively low - the main objective should be to achieve a high throughput of qualifications that are approximately right.

We believe this method is relatively robust and fit for purpose. Its cost of operation should be relatively low notwithstanding the fact that significant data gathering effort is required on student outcomes and the composition of skill demand in industry. However, again, it is sufficient if these measures 'point the allocation of resources in the right direction' rather than attempt to get the allocation exactly right.

## 6 References

- ABS (1997) Australian Standard Classification of Occupations (ASCO), 2nd Ed
- AEI-NOOSR. (2008). Country Education Profile – Australia. Canberra
- ANTA, (2004), ‘Shaping our future. Measuring the Future – Key performance measures for vocational education and training 2004 to 2010 – An Implementation Plan’. Australian National Training Authority
- Australian and New Zealand Standard Classification of Occupations (ANZSCO), First Edition, Revision 1, (cat no. 1220.0), September 2006.
- Australian and New Zealand Standard Industrial Classification (ANZSIC) 2006 (cat no. 1292.0), February 2006
- Bureau of Labor Statistics (2008) US Education and Training Classification
- CEDEFOP, 2008, Evaluation of Eurostat education, training and skills data sources. Cedefop Panorama series. Luxembourg.
- CEDEFOP (2007) Towards European skill needs forecasting. Alena Zukersteinova and Olga Strietska-Ilina (eds) Cedefop Panorama series; 137, Luxembourg: Office for Official Publications of the European Communities, 2007
- CEDEFOP (2008) Systems for anticipation of skill needs in the EU Member States, Cedefop working paper No 1, October 2008
- Cully M, Knight B, Loveder P, Mazzachi R, Priest S and Halliday-Wynes S 2009, *Governance and architecture of Australia’s VET system: Country comparisons*, report prepared by NCVER for Skills Australia
- ILO/EC, 2009, Bangladesh Skills Development Policy 2010-2015. Final Draft for Consultation. 17 Sept 2009.
- ILO (2003) Industrial Training Institutes of India: The efficiency study report. Subregional Office for South Asia, ILO, New Delhi
- ILO (2008) Availability of Data related to Technical and Vocational Education and Training (TVET) in Bangladesh, Project Research Report Series BD: 2/80, Md. Nurul Islam, ILO Dhaka, 2008
- Knight B and Cully M 2007, ‘A patchwork quilt: The development of national training statistics’ in Curtin P and Loveder P (ed’s) 2007, *Informing policy and practice in Australia’s vocational education and training sector: Reflections and futures*, NCVER, Adelaide.
- Learning and Skills Council (2008a), Framework for Excellence: Pilot Evaluation, Learning and Skills Council, Coventry.
- Learning and Skills Council (2008b) National Employers Skills Survey 2007: Key Findings, May 2008
- Lowry, Molloy and Tan, National Institute of Labour Studies, May, 2006, The Labour Force Outlook in the Minerals Resources Sector: 2005 to 2015 Report prepared for the Minerals Industry National Skills Shortage Strategy, Lowry, Molloy and McGlennon, 2008, Future skill needs: Projections and employers’ views. Australian Bulletin of Labour, 34 (2), p. 192-247
- McCoy, S., E. Kelly and D. Watson (2007), School Leavers' Survey Report 2006, ESRI and Department of Education and Science, Dublin.
- Md. Nurul Islam, (2008), Availability of Data related to Technical and Vocational Education and Training (TVET) in Bangladesh. People's Republic of Bangladesh Technical and Vocational Education and Training (TVET) Reform Project, Project Research Report Series DB: 2/08
- NCVER, (2007), Did you know? A guide to vocational education and training in Australia. NCVER, Adelaide, Australia.

- NCVER. (2009). Australian vocational education and training statistics: Explained. May 2009. NCVER, Adelaide, Australia.
- NVCER, (2009), An overview of vocational education and training in Australia and its links to the labour market. NCVER, Adelaide, Australia.
- NCVER (2009) Australian vocational education and training statistics: Explained. May 2009.
- NCVER (2008) AVETMISS Data Element Definitions: Edition 2, March 2008
- OECD, (2008), Learning for Jobs. OECD Reviews of VET – Australia
- OECD (2008a) Learning for Jobs. OECD Reviews of VET – Australia, OECD, Paris.
- OECD (2008b) Learning for Jobs: OECD Reviews of Vocational Education and Training - Sweden, OECD, Paris.
- OECD (2009a) Learning for Jobs – The OECD Policy Review of Vocational Education and Training (VET)
- OECD (2009b) Learning for Jobs: OECD Reviews of Vocational Education and Training – England and Wales, OECD, Paris.
- OECD (2010a) Learning for Jobs: OECD Reviews of Vocational Education and Training - Ireland, OECD, Paris.
- OECD (2010b) Learning for Jobs: OECD Reviews of Vocational Education and Training – Czech Republic, OECD, Paris.
- Richardson and Tan, 2008, Forecasting future demands: What we can and cannot know. Australian Bulletin of Labour, 34 (2), p 125-153
- Richardson and Teese, (2008), A well skilled future. Australian Bulletin of Labour, 34 (2), p 154-191.
- Skills Australia, 2009, Foundations for the Future: Draft Proposals for Future Governance, Architecture and Market Design for the National Training System, Position paper
- Training and Skills Commission (2009) Skills for Jobs – Priorities for Developing South Australia's Workforce. DFEEST, Adelaide, Australia.
- UNESCO, (1997). International Standard Classification of Education, 1997. Paris: UNESCO.
- Training and Skills Commission (2009) Skills for Jobs – Priorities for Developing South Australia's Workforce. DFEEST, Adelaide, Australia.
- Tertiary and Vocational Education Commission (TVEC), Sri Lanka, <http://www.tvec.gov.lk/English/index.htm>
- World Bank, 2006, The Bangladesh Vocational Education and Training System: An Assessment. World Bank Human Development Unit, South Asia Region, June 2006.
- World Bank Skill Development in India, The Vocational Education and Training System, January 2008.

## 7 List of organisations consulted

Ministry of Labour and Employment (MOLE)

Ministry of Youth and Sport (MYS)

Ministry of Expatriates' Welfare & Overseas Employment (MEWOE)

Ministry of Textiles and Jute

Bangladesh Bureau of Statistics (BBS)

Underprivileged Children's Educational Programs (UCEP)

Bangladesh Technical Education Board (BTEB)

Bangladesh Association of International Recruitment Agencies (BAIRA)

Bangladesh Garment Manufacturers and Exporters Association (BGMEA)

Khulna Polytechnic Institute

Bangladesh Rural Advancement Committee (BRAC)

Bangladesh Employers Federation (BEF)

Bangladesh Bureau of Educational Information and Statistics (BANBEIS)

Bureau of Manpower Employment and Training

Federation of Bangladesh Chambers of Commerce and Industry (FBCCI)

Bangladesh Institute of Labour Studies (BILS)

Directorate of Technical Education (DTE)

Bangladesh Association of International Recruitment Agencies (BAIRA)

## 8 Attachment 1 BTEB OCR forms

# 9 Attachment 2

## Australian Student Outcomes Survey