STED

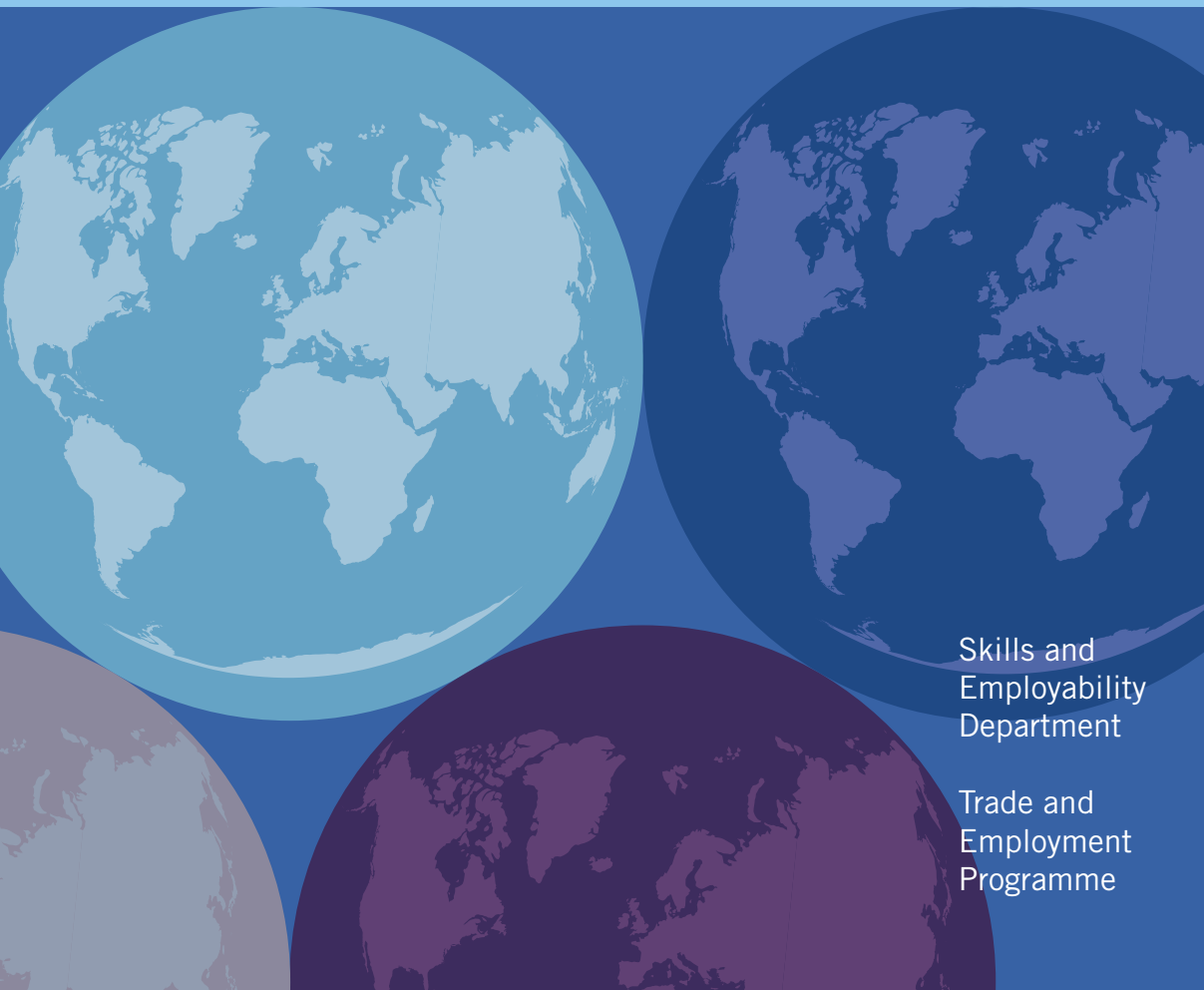
Skills for Trade and Economic Diversification

International Labour Office

Geneva

A Practical Guide

Con Gregg, Marion Jansen, Erik von Uexkull



Skills and Employability Department

Trade and Employment Programme

Skills for Trade and Economic Diversification

A Practical Guide

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FOREWORD

In today's rapidly changing and highly integrated world, skills at all levels of the firm become more and more critical for its performance and global competitiveness. Access to a skilled labour force will make it easier for firms to access new markets abroad, to survive and thrive in the domestic market and to adjust to changing conditions in global markets.

The government has an important role to play in this context, as it is an important driver behind the supply of skills in most countries. Governments contribute to the funding of education and training systems and decisions on curriculum design are often taken in public institutions. Ensuring that young people and workers in training and education acquire today the skill sets in demand tomorrow is challenging.

The ILO has designed a technical assistance tool to help policy-makers work with the private sector and employers' and workers' associations in thinking strategically about the skill demands of tomorrow and about the supply responses required today. This tool is called STED: Skills for Trade and Economic Diversification. The name indicates that STED is meant to assist in the formation of skills development policies that help countries become more competitive in the context of open markets whilst building or maintaining a sound and diversified economic structure.

STED is part of a larger set of skills anticipation tools with a sectoral focus that the ILO is developing, responding to requests from constituents included in the Conclusions on skills for improved productivity, employment growth and development of the International Labour Conference of 2008 and in line with the G20 training strategy for strong, sustained and balanced growth developed by the ILO in 2010.

This guide provides practical guidance for technical assistance projects that focus on skills policies in sectors exposed to trade. Based on the experience in four pilot countries (Bangladesh, Kyrgyzstan, the FYR of Macedonia and Ukraine) a six-stage process is presented that is typical for a STED analysis that can inform policy debates and social dialogue and lead towards the formulation of concrete recommendations at the policy, institutional and enterprise level for the design of skills policies that are more effective in anticipating and preparing for new employment opportunities in a context of global competition.

This guide is the result of work carried out under the Trade and Employment Programme of the Employment Sector of the ILO, led by Marion Jansen. It has benefited from consultations with skills development specialists, in particular Olga Strietska-Ilina and Michael Axmann, and from the reflections of specialists in the Budapest, Dhaka and Moscow offices who helped lead the country pilots. I would like to thank the authors Con Gregg (ILO Skills and Employability Department), Marion Jansen (ILO Trade and Employment Programme) and Erik von Uexkull (ILO Trade and Employment Programme). I also want to thank all the ILO colleagues who provided technical support to the preparation of this guide and the country pilot studies. And finally, my thanks go to José García for his lead role in finalizing the manuscript.

I look forward to supporting the use of this guide as part of the overall work of the ILO to promote skills to improve the employability of workers, the competitiveness of enterprises and the inclusiveness of economic growth.

Christine Evans-Klock
Director, Skills and Employability Department
International Labour Office

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This guide is based on the experience in four pilot countries: Bangladesh, Kyrgyzstan, the FYR of Macedonia and Ukraine. The authors thank ILO colleagues in regional and country offices for their important role in making STED a success, in particular Hasina Begum, André Bogui, Arthur Shears, Francis Desilva, Vasyl Kostrytsya, Olga Koulaeva, Emil Krstanovski, Mark Levin, Bolot Orokov, Aziz Kirgizbaev and Natalia Popova.

The authors also thank the consultants who contributed to the four country level reports, notably Asek Arstanbekova, Mridul Kanti Biswas, Elvira Ilibezova, Larisa Ilibezova, Ella Libanova, Larysa Lisogor, Nikica Mojsoska Blazevski, Olexiy O. Moldovan and Yaroslav Zhalilo

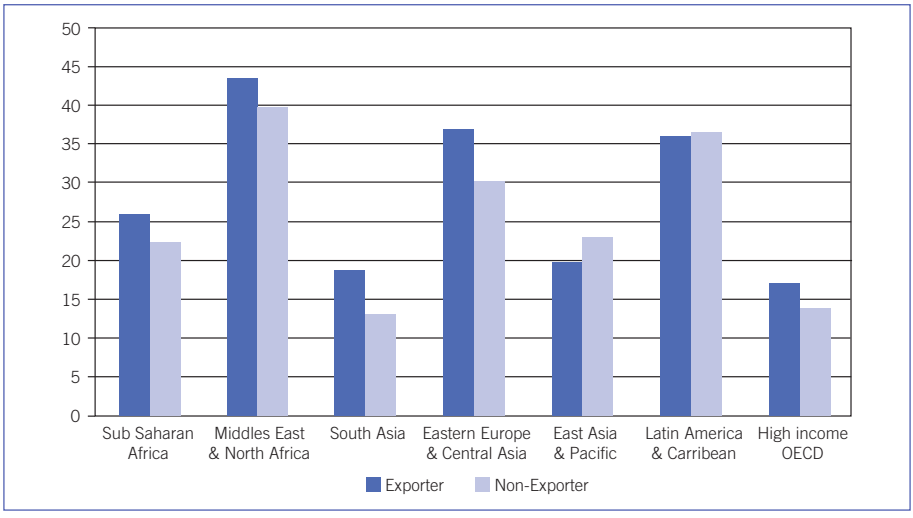
Information on activities in the four pilot countries, relevant country reports and resulting policy recommendations can be found under www.ilo.org/sted.

INTRODUCTION

Workforce skills are an important determinant of competitiveness and export success. They determine countries' ability to absorb new technologies (Hoekman and Winters 2007) and to move into new export markets (Cadot et al. 2011). Skills policies should therefore be expected to be an important determinant of the success of countries' growth and development strategies. Yet, designing successful policies, remains a challenge. Experience from countries that have benefited from globalization suggests that strategic coordination between trade, investment, development, and skills policies was an important factor for success.

Exporters tend to be larger, more productive, and employ more highly skilled workers than non-exporters. Enterprise survey data also shows that many firms around the world rank finding adequately skilled workers as a major constraint to their business (Figure 1). Thus, in order for trade openness to translate into sustainable

Figure 1: % of firms interviewed ranking "Inadequately Educated Workforce" as a major obstacle



Source: World Bank Enterprise Survey Data (2006-11).

growth, investment in skills formation is crucial, especially in developing countries where skilled labour is scarce (Andersen and Babula, 2008).

In a fast changing world employers' demand for skills changes rapidly. It is becoming increasingly challenging to anticipate skills demand. Higher education levels increase workers' ability to adjust to change (Woessmann 2011). Nevertheless it is important to carefully consider which skills to teach in order to avoid situations of skills mismatch. Skills mismatch – a situation where the skills taught by education institutions do not match the demand of the labour market – is a common phenomenon and has high social and economic costs (ILO 2008), in particular when it takes the form of youth unemployment.

STED is a technical assistance tool developed by the ILO that provides strategic guidance for the integration of skills development in sectoral policies. It is designed to support growth and decent employment creation in sectors which have the potential to increase exports and to contribute to economic diversification.

STED takes a forward looking perspective, anticipating sectors' development and growth opportunities based on their global competitive position and market development. Together with an analysis of current skills supply and demand, this provides an outlook of existing and future skills shortages. Thus, STED supports the formation of skills for which there is demand in the labour market and helps to avoid skill mismatches that contribute to unemployment, in particular among the young.

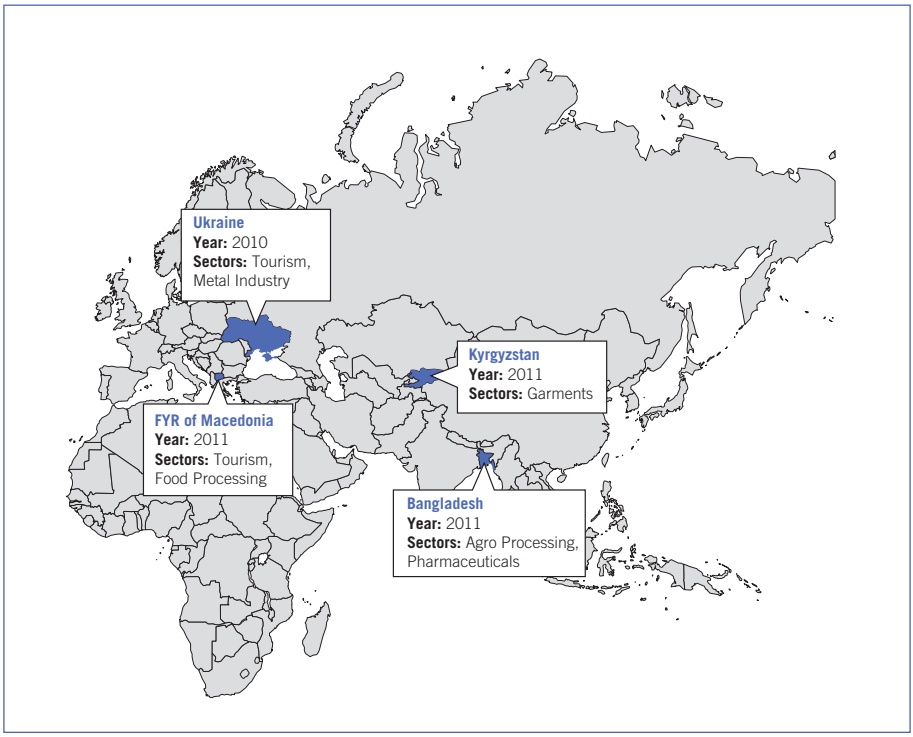
The outcomes of STED are concrete recommendations at the policy, institutional, and enterprise level. The process involved in designing those recommendations contributes to improvements on the ground by raising awareness and stimulating dialogue on skills development among key stakeholders within a sector.

This report presents the STED methodology, developed through four pilot STED initiatives, undertaken in Bangladesh (2011), Kyrgyzstan (2011), the FYR of Macedonia (2011) and Ukraine (2010), and drawing on earlier experience in trade and skills policy. Figure 2 illustrates on which sectors the work in those four pilot countries focused.

This guide has been prepared with the needs of ILO technical assistance primarily in mind. The working processes and the approach to formulating recommendations that the guide describes are tailored to the needs of technical assistance projects and initiatives, whether the STED process is undertaken as part of an integrated programme of assistance, as a preliminary analysis to guide future technical assistance, or as a stand-alone advisory activity. The guide assumes that STED analysts will have access to stakeholders that include the ILO's tripartite constituents in the country receiving technical assistance. The guide is designed to be relevant whether the technical assistance is provided by the ILO alone, or in collaboration with other organizations.

The STED analytic approach can also be applied outside the ILO technical assistance context. It is suited to sectors involved in, or exposed to, international trade in countries at any stage of economic development. More generally, therefore,

Figure 2: STED pilot initiatives.

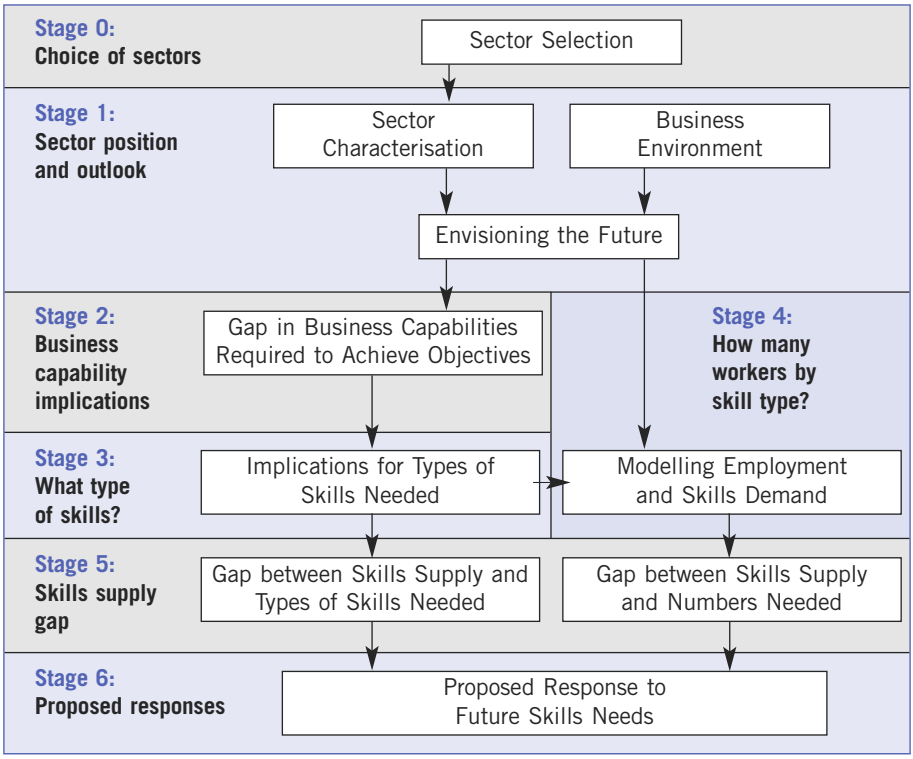


this guide will be useful for all policy-makers who want to rethink domestic skill policies with a global context in mind.

This guide is written according to the six stage framework that is applied in the context of any STED analysis. The six stages are reflected in Figure 3. After a preliminary sector selection stage, the analysis moves in stage one systematically from analysing the sector ("Sector Characterization") and the environment in which it operates ("Business Environment"), through envisioning how the sector can develop into the future ("Envisioning the Future").

The second stage analyses the implications that achieving this vision of the future will have for the business capabilities required by firms. STED uses the term *business capabilities* to refer to things that firms in the sector can do. The third stage identifies the implications of future business capability requirements for the skills that will be needed into the future. The fourth stage considers how many workers will be required by skill type, with the possibility of modelling the demand for workers if the necessary data is available. The fifth stage looks at the gap between the skill requirements of the future and current skills availability, in both qualitative ("Gap between Skills Supply and Types of Skills Needed") and quantitative ("Gap between Skill Supply and Numbers Needed") terms.

Figure 3: The 6-stage STED framework



Finally, the sixth stage concludes by developing proposals for responding to the skill gaps identified. In this final stage, practical solutions are proposed regarding:

- How existing training and education institutions can be used to better meet demand;
- What other sources of skills supply can be used;
- How skill demand can be better anticipated in the future;
- How enterprises can improve the skills of their workforce.

STAGE 0: SECTOR SELECTION

STED is a sector level methodology. As resource availability does typically not allow for STED work to cover the entire economy, it is often necessary for STED work to start with a sector selection process. During this stage it is determined on which sectors STED activities will focus in a given country.

0.1 CRITERIA FOR SECTOR SELECTION

While STED initiatives conducted so far have covered no more than two sectors, a larger STED project could cover a greater number of sectors. Even so, it will still be necessary to prioritise between sectors where there is scope for an initiative to have a major positive impact and sectors where there is less potential benefit.

STED is designed for sectors with potential to make substantial contributions to export development and diversification, or which need to improve competitiveness in the face of foreign competition. They can be sectors that are still in their infancy, or established sectors with potential to diversify, for example through better products or new markets.

STED is not designed for sectors whose exposure to international trade is limited and is likely to remain limited. While much of the methodology could be applied in any sector, STED's design prioritises issues connected to success in international competition that may not be relevant to non-tradable sectors.

Box 0.1: Sectors addressed by STED pilot projects

STED projects undertaken up to the end of 2011 have covered either one or two sectors.

- In Bangladesh the sectors covered were agro food and pharmaceuticals.
- In Kyrgyztan the sector covered was ready-made garments.
- In the Former Yugoslav Republic of Macedonia the sectors covered were tourism and hospitality and again agro food.
- In the Ukraine the sectors covered were metals, principally steel, and also tourism and hospitality.

Detailed information on relevant country level work can be found on the ILO webpage dedicated to STED: www.ilo.org/STED.

When choosing between sectors it is necessary to take a number of factors into account.

A key issue is the need to take account of the likely impact of developments in a sector on employment. In the case of a sector with export potential, it is important to look at the likely impact of growing exports on employment, looking both at direct employment in the sector and at indirect employment in other sectors arising from supplying the exporting sector. For example, growing exports of processed food products can create significant direct employment in food processing businesses, but can create even larger volumes of indirect employment in the agricultural sector, and can also create indirect employment in other sectors such as transport, storage and packaging. In developing economies it is frequently the case that many of those working in agriculture are involved in subsistence farming, and giving them a commercial outlet for their operations can allow them to enter the market economy, improving their incomes and economic prospects.

In the case of a sector a is becoming more exposed to international competition, either in its domestic market, or in its traditional export markets, it is important to consider to what extent performing better in these markets could potentially grow employment, and to what extent loss of competitiveness in these markets could cost employment. It is desirable to consider both direct and indirect employment effects. The number of jobs is not the only important factor. The quality and sustainability of employment are also important. High-quality jobs that offer decent pay and working conditions and security of employment are attractive. Sustainability of jobs in the context of changing competitive, economic and social conditions should also be considered.

In this context, economic diversity is important, so sectors that offer the opportunity to increase economic diversity may deserve to be prioritised for the purposes of STED. A country heavily reliant on one specific sector risks serious economic dislocation if that sector loses competitiveness or if the sector's international market conditions deteriorate. For example, many countries have experienced a period of rapid ready-made garment sector growth that has ended and even gone into reverse as their labour costs have increased, and as new locations with lower costs have become viable competitors.

A further issue in choosing between sectors is the extent to which the skills needs of each sector are already well understood. A sector that is growing from a small export base, or which is changing rapidly in some other way, may take priority over a much larger and economically significant sector whose skill needs are already well understood by businesses in the sector and by providers of relevant education and training.

The choice of sectors should usually be coherent with the country's strategy for economic development, if it has such a strategy, whether explicit or implicit. If a country already has a well-developed consensus on its strategy for economic development, it is not the purpose of STED to reinvent it. However, coherence with economic strategy means targeting the sectors where STED can do most good, which will not always be the sectors given highest priority under the strategy. For example, if the skills available to the country's leading export oriented sectors are already

satisfactory, it may be better for STED to focus on newly emerging sectors that offer potential to diversify the country's exports.

0.2 CONSULTATION ON CHOICE OF SECTOR

When choosing between sectors for a STED project it is necessary to take account of the availability of local partners in each sector that can advise and assist on the project, and can both enable the sector to internalise what is learned from the research and take the lead in validating and implementing the findings and recommendations of the research.

Employer organizations and trade unions can make an important contribution. At a minimum, it is necessary that they should be consulted – that their perspectives should be taken into account and that they should validate the findings. There is also scope for them to be involved more directly in the research in terms of contributing information, assistance in identifying and gaining access to interviewees, and in some cases contributing to project management.

Exactly who can usefully be involved in sector selection will be contingent on the circumstances in the specific country, but bodies such as employer federations, trade union federations, and government ministries and agencies responsible for enterprise development, trade and education and training should be considered.

It is important to consult with country stakeholders on the sectors to be addressed using STED for the following reasons.

- Understanding the potential of a sector and its ability to behave strategically requires a good knowledge of the country and of the specific sector. Consulting people with local expertise provides important information that makes better choices possible.

- An effective STED investigation requires collaboration between the lead analysts, ILO staff active in the country and organizations in the country such as government ministries and agencies, the national statistical office, industry and employer representatives and workers' representatives. The collaboration is more likely to occur and be effective if it is understood that relevant stakeholders in-country have been consulted on issues such as the choice of sectors.

- The purpose in undertaking a STED initiative is to inform action to benefit the sectors studied. A large part of the benefit from STED comes from developing a better understanding of the sectors' business and skills challenges, and what can be feasibly done to address these. Involving key actors interested in each sector in the process makes an important contribution to developing this understanding, and to ensuring that those in a position to act feel that they own the analysis, conclusions and recommendations, and that their ownership is shared by other people and organizations important to their sector. Involving them in STED from its very initial stages contributes to this.

0.3 IMPLICATIONS OF STED SECTOR SELECTION

Selecting sectors for policy attention, as STED does, can give rise to questions about whether the selection:

- might have broader use as a basis for prioritising investment and policy attention in areas beyond skills; or
- could have unjustified negative effects on other sectors denied investment or policy interventions because they have not been targeted by STED.

The sector selection phase of a STED initiative is not designed to guide wider policy choices beyond skills. While it may produce perspectives that make a useful contribution to wider policy choices, it is quite a limited exercise by design. If a country requires broader advice on industrial policy or development policy, this would require much more extensive analysis of the country and its sectors than is usually undertaken in STED sector selection.

STED is intended to benefit the sectors studied, mainly by providing the information that governments, providers of education and training, businesses and providers of technical assistance and funding need to make good decisions about skills development for those sectors. Typically, many findings of a STED initiative can be implemented by better targeting and application of existing resources, rather than by diverting resources that currently benefit other sectors.

Initial indications are that STED will often increase resources available to developing countries. STED can help donors and providers of technical assistance identify high impact skills projects to support. A country may thereby be able to secure funding for interventions in sectors studied through a STED initiative without cutting the resources available to other sectors.

A STED initiative may eventually benefit not just the sectors it studied directly, but other sectors too. Some findings in one sector may be applicable in other sectors. For example, a proposal to improve education and training for an occupation may also benefit other sectors that employ workers in the same occupation. Last but not least, STED also can contain capacity building components to build capacity among local partners in skills anticipation and to take responsibility for future application of the STED approach in the country.

STAGE 1: SECTOR POSITION AND OUTLOOK

1.1 INTRODUCTION

Stage 1 of the STED process examines the sector and the environment in which it operates, and takes a view as to the outlook for the sector.
It is made up of three parts.

- *'Sector characterization'* describes the sector as it is in both quantitative and qualitative terms.
- *'Business environment'* analyses the business environment within which the sector operates, with a particular focus on world market trends, industry competitive analysis and drivers of change.
- *'Envisioning the future'* considers scenarios for how the sector may develop and develops a vision for the sector's future development based on these.

The analysis in this first Stage of STED is very broad, and it would not be realistic to undertake each component in a great deal of depth. While a researcher should pay some attention to the full range of issues described in this chapter, it is necessary to prioritise when undertaking the analysis. When presenting findings, it is important to focus on the key issues that have emerged, rather than laboriously recounting the detail of the analysis that went into identifying them.

At this stage of the STED analysis work should be conducted following an iterative process. The initial analysis should focus on what is available from the literature, from statistical sources and from the knowledge of those involved in the STED initiative. It should be revisited as the STED initiative progresses, producing more information and better insights.

The analysis in this stage draws on approaches from both economics and business studies. A general business strategy text, such as Thompson and Strickland's Strategic Management[1], will be of assistance to STED analysts who do not have a business studies background.

[1] Strategic Management: Concepts and Cases 12th Edition, A. Thompson & A. Strickland, McGraw Hill, 2008.

1.2 SECTOR CHARACTERIZATION

Work at this stage focuses on describing the sector as it is, in both qualitative and quantitative terms.

1.2.1 Sector definition

Research into a sector for STED should start from a clear definition of the sector. The most practical approach to defining the sector is most often to use sectoral definitions drawn from the system of industrial classification used by the country's national statistical office. In most cases, this national system of classification will be based on the International System of Industrial Classification (ISIC), the most current version of which (Rev. 4) was introduced in 2008. In some cases it may be based on an old version of ISIC, or may have been adapted to better fit local conditions. Many European countries use the European Union's NACE Rev.2 system of classification, which is similar to ISIC Rev. 4.

Using a sectoral definition based on the national system of industrial classification allows data from the national statistical office to be used in the research. The definition may be based on one specific sector code, or on a collection of sector codes. For example, under ISIC Rev. 4, *Manufacture of food products* is a 2 digit classification (Division 10) with eight 3 digit components – from 101 *Processing and preserving of meat* to 108 *Manufacture of prepared animal feeds*. It is a subclassification of Sector C *Manufacturing*.

A sectoral definition based on one or more high level codes within the system of industrial classification is usually preferable to one based on more detailed codes, as many national statistical offices prepare important sector level statistics at a level equivalent to ISIC 2 digit, or at a higher level of aggregation. More detailed statistics may not be available, or may only be available for a subset of surveys.

Once a tentative sectoral definition has been chosen based on the national system of industrial classification, it is necessary to review how satisfactory it is for the purposes of the research. Standard sectoral definitions do not always correspond well with sectors as understood by those in industry and government who STED is intended to assist. Key questions to ask, therefore include the following: Is there a substantial part of the sector, as defined tentatively, that is outside the scope of the sector as understood by stakeholders? For example, stakeholders for a STED study of an agro-food sector may be interested only in products with export potential, while ISIC Division 10 *Manufacture of food products* will also cover processing of food staples grown only for the domestic market. Another relevant question is whether there is substantial activity outside the sector, as defined tentatively, that should ideally be covered by the research? Perhaps this might be activity in production of inputs or in provision of services to the sector. Perhaps the activities of concern straddle the boundary between two or more sectors as defined in the system of classification. If so, is it sufficient to address the wider

set of activities as a supplement to the investigation of the sector as defined tentatively, or is there a compelling reason to include it within the definition of the sector?

If these questions point to problems with the definition, it is necessary to examine whether there is a better way to proceed. Options may include the following.

- Using the tentative definition, but explicitly focusing parts of the research and report on specific subsectors and/or on activities that take place outside the defined sector. For example, a study on a food sector might focus just on product areas likely to be traded internationally. In addition to focusing on food processing itself, it might also pay some attention to food producers (farmers, aquaculture enterprises, …), supply chain intermediaries and firms involved in food logistics.

- Choosing a somewhat different set of codes from within the national system of industrial classification. For example, in addition to ISIC Division 10 *Manufacture of food products*, an investigation of food processing might also look at the closely related Division 11 *Manufacture of beverages*.

- Using a sectoral definition from another source, or constructing an original sectoral definition. For example, one sector study on wind energy surveyed firms involved in wind farm development and operations from the whole value chain within a country, covering professional services firms, construction firms, engineering services firms and firms involved in operating and/or managing wind farms. (IWEA and Deloitte, 2009[2])

Obtaining quantitative data for a non-standard sector definition would most likely require a substantial industry survey, which would require significant resources. In most cases, it could only be justified if data available from official sources was particularly limited, or if the case for using a non-standard sector definition was particularly strong. All STED initiatives to date have relied mainly on official data sources, with original survey work being absent or limited in scope. This report does not provide guidance on how a substantial industry survey could be conducted.

1.2.2 Quantitative profiling

A STED report on a sector should generally start with a profile of the sector. This should combine a description of the sector with quantitative data on the sector. The sector profile should place the sector in the context of the country's wider economy, both descriptively and through comparisons between sector data and whole-economy data.

[2] IWEA &Deloitte (2009).

The characteristics of the sector affect what data are of most interest. For example:

- In a sector such as food processing, where there are major differences in products, processing, markets and skills requirements between subsectors, it may be useful to analyse subsector data where available.
- In a sector such as hospitality, where there is often a considerable amount of seasonal, part-time and casual work, it is likely to be useful to analyse data on employment disaggregated by type of employment relationship where available.

Types of sector level data likely to be useful – if available - in all STED research include the following.

- Gross output or sales
- Domestic sales
- Exports
- Imports
- Employment
- Labour productivity (ideally, net output per employee, but gross output per employee is a reasonable substitute)
- Occupational composition of employment
- Gender composition of employment
- Labour costs and pay

Time series in tabular and chart form are useful for analysis, and for presentation in the report. In some cases, presenting data for a single year is less cluttered, and makes for a better presentation in the report.

Depending on data availability and on the issues found to be important for the sector, other types of sector level data that are frequently useful include:

- Disaggregation of employment between small, medium and large businesses
- Workforce turnover rates per annum
- Age profile of workforce
- Educational composition of workforce, and how this varies by occupation and by size of business.

Data can be presented for the sector as a whole, or for subsectors where suitable data are available. Where foreign direct investment (FDI) accounts for a significant part of the sector, it can be useful to disaggregate numbers between foreign owned and domestically owned businesses. If publicly-owned businesses or cooperatives

form a significant part of the sector, it may also be useful to disaggregate numbers for these.[3]

Data on trade and output may be available in the national currency, in US dollar equivalents or both. At the analysis stage, it is useful to look at both where available, and to understand the impact of exchange rate developments and inflation on prices and on costs within the country (including labour costs). At the report writing stage, it is preferable to standardise on one or the other.

Selective comparisons with national data and data for other sectors can also be useful – for example tracking how the share of exports accounted for by the sector has developed, or at how average pay in the sector compares with national averages or with other sectors. Where data on the share of GDP accounted for by the sector is available, it should be included.

Key sources for data include the following:

- **Data on gross output or sales** by the sector are likely to be available from a survey by the national statistical office. Failing that, in many cases there will be a privately conducted survey available, conducted periodically at sector level by a market research business or by an industry association. If the sector is represented in an input-output table or social accounting matrix table for the country, this will include a measure of the sector's output, although it will often be a few years out of date.
- **Data on domestic sales** may be available from a market research source. It may alternatively be available from an input-output table or social accounting matrix. As an alternative, it could, in principle, be calculated as output plus imports minus exports, but issues with comparability of different sources can make it difficult to avoid errors.
- **Trade data** may be available from an official source within the country, but are also available from international sources. The principal international sources are the United Nations Commodity Trade Statistics Database (COMTRADE) and the United Nations Industrial Development Organization (UNIDO) and Eurostat, the statistical agency of the European Union.

  Most often, two types of data are available for trade in a commodity – export data collected by the exporting country and import data collected by the importing country – making it necessary for the researcher to assess which type

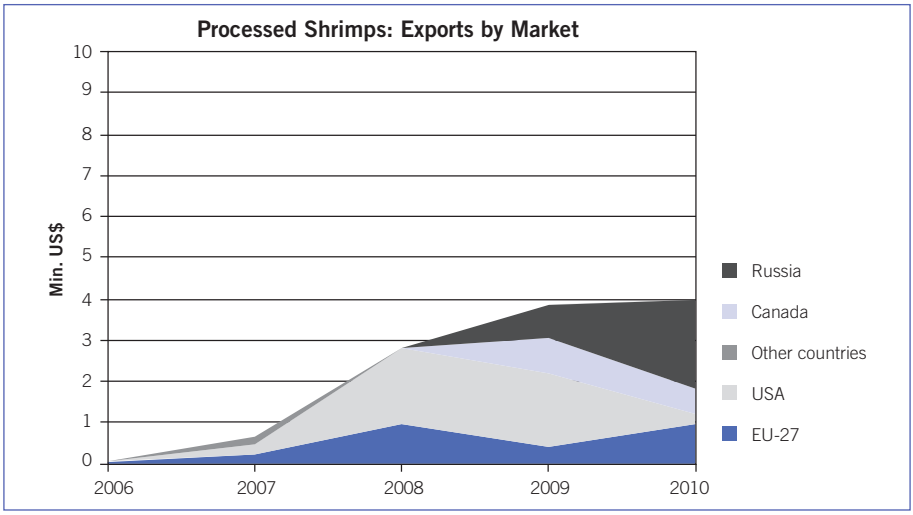
[3] Individual firms may have mixed ownership – a combination of foreign and domestic or a combination of public and private. In most cases, it is necessary to rely on decisions made by the organization from which the data has been sourced as to how these should be classified. If STED analysts have the opportunity to define how businesses are classified between domestically owned and foreign owned, three categories would be useful – foreign ownership of greater than 50% (majority), foreign ownership of 5% to 50% (significant, but not majority), and domestic ownership of greater than 95%. Foreign holdings that arise just through foreign activity on domestic stock markets can be neglected, as they are likely to be difficult to measure and will typically not reflect foreign involvement in firm management or governance.

of transaction is more likely to have been recorded accurately and in full, in order to choose which to summarise in the report. Assembling trade data for a sector is complicated by the fact that trade is reported under commodity codes that do not record which sector produced the commodity. However, concordances are available that link commodities to the industry sectors that usually produce them.

Trade data are central to STED because of its focus on developing export markets and on competing effectively with imports. Trade data are available at a much greater level of detail than data on industry sectors, making it possible to identify very detailed information on products exported and imported. Most often, data on the value of trade are more useful than data on the volume of trade, which may be in units that are not meaningful for sector analysis.

It is possible to do more with trade data than just report on trade in and out of the country being studied. It is useful, for example, to identify main export destinations (see figure 1.1), to look at market shares in main export destinations, and to identify main competitors in global markets. Based on this, it is also possible to look at growth rates in imports and exports, and at how these differ between groups of commodities and between different exporting and importing countries. While analysis of this sort does not measure goods produced and consumed within a country, it can provide a good insight into trends in those parts of markets serviced by imports. Depending on the commodity, this can be most of the market, or a smaller share of the total market.

Figure 1.1: Example of analysis of trade data: Structure of sector exports by destination



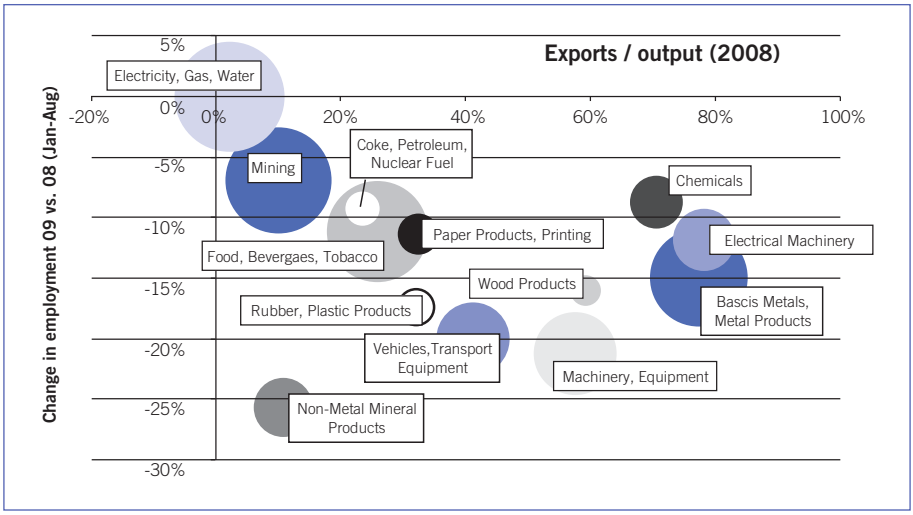
Source: Comtrade (2006-07), EPB (2008-10).

- **Sector level data on employment** may be available from enterprise surveys, from surveys of households or in some cases from public administrative data. Exactly what is available varies between countries. Sector employment estimates may emerge from more than one type of survey. The research should collect all that are available. It should attempt to evaluate which is more reliable, or representative of reality, if (as is frequently the case) there are significant differences. Figure 1.2 illustrates an example where sectoral information on employment has been combined with sectoral information on trade.

  Skills research, such as STED, usually uses estimates of sector employment from labour force surveys of households where available, particularly if the most recent survey is fairly current, if there is a series of data points available, and if the survey sample size and quality of data coding are considered to be sufficiently reliable so that the estimates are likely to be of good quality. A key advantage of using labour force survey data is that it will be coherent with sector occupational data from the same source.

  In principle, a recent census of population could be used in place of a labour force survey if it collected data on sector of employment and (ideally) on occupation. However, while population censuses have the advantage that they survey all or most of the population, they are generally conducted too infrequently to provide useful time series. Moreover, the tough job of coding on sector of employment and occupation accurately may receive less attention than with a labour force survey, affecting the reliability of the data reported.

Figure 1.2: Ukraine: Employment Change vs. Share of Output Exported by Sector



Source: Authors' calculation based on data from Ukraine State Statistics Committee.

- **National level labour market data** is likely to be available both from national sources and from international sources. The ILO's Key Indicators of the Labour Market (KILM)[4] database is a key source, which covers most countries. It covers a range of indicators likely to be useful for STED including employment by high level sector, and national data on employment by high level occupational grouping, productivity, wage and compensation costs, educational attainment among others.
- **Data on labour productivity for a sector** is useful for STED, but it may not be available from national official sources. In principle, it can be calculated from employment data and data on net output, with analysis of trends and comparisons ideally taking account of variation in working hours. KILM analyses on labour productivity at national level are based on GDP per person employed, with employment data based (where possible) on the average number of people with one or more paid jobs during the year. Differences between countries in what data is available at sector level make it difficult to prescribe how calculating sector level labour productivity should be approached. In a small minority of cases, there may be sufficiently detailed sector output data in the country's national accounts so that it can be used along with employment data from a source such as a Labour Force Survey. In other cases, the national statistical office may publish sector level data on net output and employment from official enterprise surveys (such as those published by Eurostat as Structural Business Statistics for EU countries). In some cases, data on the sector may be available based on surveys by other branches of government, by international organizations, by industry organizations or by market research firms. In some cases, data is available on a limited sample of firms in the sector.

  An issue that requires particular care is in choosing which of the available measures of employment should be used. What is available is typically measures such as full time employment, part-time employment, employment of contractors and seasonal employment, typically measured at a point in the year. Depending on employment patterns, it may or may not be possible to construct a reasonable proxy for average employment from these.

  An alternative to obtaining productivity data from official national sources is to draw on other surveys, such as World Bank Enterprise Surveys. These surveys make available enterprise level data on employment and sales, among other measures, for a sample of companies classified by sector. In principle, this can be used to estimate labour productivity for the sector. However, in practice, complications arising from seasonality of employment and part time working may pose problems with estimating labour input.

[4] http://kilm.ilo.org/kilmnet/.

- **Data on the occupational composition of employment** in a sector is important in STED because it is the main type of statistical information that directly addresses skills. It provides a quantitative basis for qualitative analysis and discussion of skills. It is also an important component of quantitative modelling of demand for skills.

  The source usually used for data on the occupational composition of employment in a sector is a current labour force survey. This should be the first type of source pursued. The information required is typically not published at this level of detail, so it is generally necessary to seek the collaboration of the national statistical office to gain access to anonymized, coded survey data.

  However, problems may arise in practice.

  - While labour force surveys are conducted as often as quarterly in many developed countries, they are conducted much less frequently in many developing countries. There may not be a recent survey available.
  - Depending on the size of the sample surveyed, there may not be enough responses that relate to the sector of interest to provide a reliable profile of employment by occupation in the sector. Sampling rates are often lower in developing countries than in developed countries, adding to the likelihood that this will be a problem. STED analysts should assess whether sufficient responses are available before deciding whether to publish a sector occupational profile based on a labour force survey.
  - Correct coding of occupations and sectors, based on descriptions provided by households, is technically challenging, and is not always conducted accurately. The problems tend to be greater at more detailed levels of occupational coding – coding at ISCO (or national equivalent) 1 digit level tends to be accurate, but coding at 3 digit or 4 digit level can be erratic or follow overly simple rules. As published labour force survey results are

Box 1.1: Software tools

Collation and analysis of statistics in the context of STED is typically done using both spreadsheet and statistics software. Excel and Stata have been used for STED analyses to date, but similar software can also be used.

Where significant volumes of data are analysed, using significant numbers of classification codes, it is important to approach the analysis in a highly structured way that allows the analysis to be checked easily. This is important for analysis of trade data and analysis of labour force survey microdata. It can be done more easily in statistical software than in a spreadsheet. In Stata, the use of "Do" files facilitates this.

often only produced at a high level of coding aggregation, these low level coding problems may have no negative impact on the quality of published results, while posing significant problems for the quality of a detailed occupational profile prepared from the same data. It is necessary, therefore, for STED analysts to assess the plausibility of the occupational profile obtained from the labour force survey before basing any analysis or model on it, and before publishing it.

If the labour force survey approach does not produce usable results, three other approaches are worth considering.

- A survey or set of case studies of a sample of businesses in the sector can be undertaken including one or more questions on the numbers employed in each business by occupation. The sample should be designed to be reasonably representative. The results can be reported for individual businesses[5], or can be aggregated, using appropriate techniques, to estimate the occupational composition of the sector as a whole[6]. An interview survey such as this was conducted in the Bangladesh pharmaceutical sector, collecting a wide range of firm level information that included data on the occupational composition of employment in firms.

  An enterprise survey of occupational composition should be based on a restricted list of occupations, which requires that the analysts either have significant pre-existing knowledge of occupations in the sector, or that they consult with industry specialists on the occupations to be included.

- If no reliable data on the occupational composition of employment in the sector is available for the country being studied, but data on the occupational composition of employment is available for the same sector in a comparable country in which the sector has a similar profile, this can be used in the analysis, and could be quoted in the report. For example, if the survey data mentioned above on the Bangladesh pharmaceutical sector had not been available, the next step would have been to seek data on the occupational composition of the broadly comparable Indian pharmaceutical sector.

[5] This is subject to the need to respect commitments to confidentiality, explicit or implied. Published data on the occupational composition of a business should usually be presented as percentages rather than in absolute numbers, as this is more informative and also obscures the exact size of the business.

[6] If sufficient resources are available for a substantial survey, a full survey might be feasible for a small sector. For a larger sector, an approach based on surveying all large firms, a substantial sample of medium firms, and a smaller sample of small firms might be appropriate.

- If there is a recent census of population, it may have collected information on sector of employment and occupation. Using census data (or a substantial sample, such as 10%, drawn from the census population) would largely overcome the problem with sampling error. However, the potential for coding problems is at least as great with census returns as with a labour force survey. A further consideration is that responding to a request for census data of this sort may be more difficult for a national statistical office than a similar request for labour force survey data.

- In most countries, the main sources of data on employment distinguish between male and female employment totals, so data on the **gender composition of employment** can be based on the same sources as other employment data.

  Occupational employment data for a sector disaggregated by gender is typically available from a labour force survey. It is, most often, best to report this only at a high level of aggregation – equivalent to ISCO one digit – as this level of detail is usually sufficient for analytic and presentation purposes, and as lower levels of aggregation by gender are often subject to substantial sampling error.

- **Data on labour costs and pay** is useful, particularly for the insights it can provide into the sector's cost competitiveness relative to international competitors, and into the quality of employment in the sector – decent pay is an important criterion for decent work. Data on trends in pay can also throw light on any recruitment difficulties observed; problems recruiting may be a consequence of low pay rather than labour shortages; and problems recruiting for high skill jobs despite good pay and an adequate supply of skills may be a consequence of poor working conditions.

  When interpreting data, however, it is important to take account of trends in consumer price inflation and in exchange rates with major international currencies. It is possible to take account of consumer price inflation quantitatively through deflating data on nominal pay by a consumer price index for the country. It is possible to take account of exchange rates with international currencies by converting nominal pay to a major international currency – typically US dollars.

  Various sources of data may be available. Official statistical sources may provide data on pay, total wages and salaries, labour costs per employee, or total labour costs. Industry organizations may collect data on pay and labour costs. It may be difficult to make direct comparisons of labour costs with those in other countries, but in many cases secondary research will identify existing reports that address this topic.

  Even if data on labour costs and pay for a specific sector are not available, it may be possible to draw inferences about labour costs based on data for the country as a whole or for comparable sectors supported by qualitative information from the research.

When interpreting data about labour costs, it is important to take account of regional differences within a country. In many developing countries, there are substantial variations in labour costs between regions, with labour costs in areas with relatively good infrastructure and existing exporting industries being higher than those in less developed areas. Comparisons of labour costs between two countries, for a type of sector, should reflect the locations where their operations are based, so far as possible.

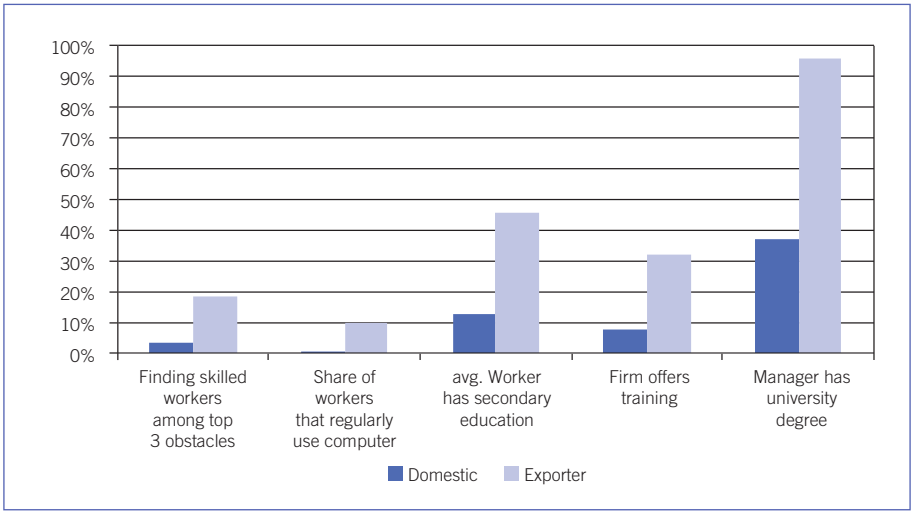
It is important to be conscious that pay is not the only component of the cost of labour, that competitiveness on the cost of labour is just one component of overall cost competitiveness, and that non-cost dimensions of competitiveness (including labour productivity) are important too. Indeed, in focusing on skills, STED is primarily about improving competitiveness through non-cost means.

- In addition to the sort of core quantitative information outlined above, a STED initiative should have access to **survey data on the sector**. Survey results are useful both for analysis of the sector, and to illustrate the analysis provided in a STED report.
    - The World Bank conducts Enterprise Surveys in most countries in collaboration with partner organizations[7], and makes the micro-data available to researchers[8]. This makes it possible to tailor analysis based on this source to the specific needs of the STED study, which makes BEEPS a particularly good data source for charts and tables to illustrate the STED report on a sector. The World Bank surveys cover a sample of businesses in each country, and the responses can be segregated by sector. The surveys cover a wide range of topics that can contribute to a better understanding of strategic and skills issues for a sector. Examples of topics often covered include: the share of employees in research and development; whether firms have launched new products; and whether firms provide training. Figure 1.3 illustrates an example of information available on firms active in the agro-food sector in Bangladesh.
    - A STED initiative requires original research into the sector being studied, which can include a survey. The survey can be used: to bridge gaps in the core quantitative information outlined above; to gather other

[7] "The Enterprise Surveys implemented in Eastern Europe and Central Asian countries are also known as Business Environment and Enterprise Performance Surveys (BEEPS) and are jointly conducted by the World Bank and the European Bank for Reconstruction and Development. Enterprise Surveys in Latin America are jointly funded with the Inter-American Development Bank (IDB) and surveys in the Caribbean are jointly funded with IDB and COMPETE Caribbean. Enterprise Surveys in South Asia and upcoming African countries are jointly funded with the UK's Department for International Development (DFID)." www.enterprisesurveys.org/.

[8] This can be found at: http://www.enterprisesurveys.org/.

Figure 1.3: Example of analysis of survey-based firm level data: firm characteristics in Bangladesh's agro-food sector



Source: World Bank Enterprise Survey Bangladesh 2007.

quantitative information considered to be relevant to the STED research; and to gather qualitative information. The Appendix of this Guide provides an example of a survey instrument used in one of the STED pilots.

- In many cases, national agencies responsible for promoting inward investment or for enterprise development undertake surveys. It may be possible to get access to data or to summary results.

Table 1.1 presents a list of readily available international data sources. Where appropriate, STED often includes an effort to collect more detailed information from national sources. If research on quantitative information is carried out effectively, and if data availability is typical of a developing country that receives significant assistance from the international community, then this phase of the research will generate much more data than can reasonably be included in a STED report on the sector. It is necessary for the researchers to be selective in what they choose to include, focusing on:

- providing a good statistical overview of the sector,
- profiling the sector's workforce and their occupations; and
- providing a factual quantitative underpinning for the findings of the remainder of the report.

Table 1.1: Main international data sources

Trade and Market Access Data		
COMTRADE	Global Import and Export data	http://comtrade.un.org/
TRAINS	Global Import and Tariff data	http://r0.unctad.org/trains_new/database.shtm
WITS	A convenient browser to access COMTRADE and TRAINS data and to convert to different industry classifications	http://wits.worldbank.org/wits/
ITC Trade Map	Based on data from COMTRADE TRAINS and other sources, provides a user friendly interface to analyze trade flows in terms of main markets, competitors, market demand trends, etc.	www.trademap.org
ITC Market Access Map	Based on data from COMTRADE, TRAINS and other sources, provides a user friendly interface to analyze trade and market access data	www.macmap.org
Enterprise Data		
World Bank Enterprise Surveys	Standardized Entperprise Survey covering most developing countries with a number of questions (eg. Firm characteristics, work force, perception on main constraints) of relevance for STED work. Aggregate statistics can be produced via web interface, and firm level rawdata is available via the homepage upon request.	http://www.enterprisesurveys.org/
Industry Data		
UNIDO Industrial Statistics	Global database with information on number of firms, employment, wages, output, value added, and investment by industrial sector.	http://www.unido.org/index.php?id=1000309
Employment Data		
Key Indicator of the Labour Market	Detailed macro information on various aspects of employment, unemployment, labour force participation, wages, labour productivity, education attainment. Data on employment by wide industrial sectors and occupation.	http://kilm.ilo.org/kilmnet/

1.2.3 Qualitative profiling

In addition to profiling the sector in mainly quantitative terms, it is also important for the research to develop a good qualitative understanding of the sector, both in terms of interpreting the quantitative data and in terms of describing and analysing the sector's characteristics. Important types of analysis to be conducted include the following.

- **Industry value chain analysis** – describing the value chain (or chains) in which the sector participates, and where the sector fits into the value chain(s)
- **Position in markets** – looking at how the sector is positioned in the product-markets and geographic markets in which it is present
- **Work organization** – looking at the typical way in which work is organized at the firm level within the sector
- **Technologies** – the main technologies that are important to the sector
- **Economic geography** – taking account of geographic concentrations of businesses in the sector, in similar sectors and along the sector's supply chain and examining their relevance for capabilities, competitiveness and infrastructure.
- **Institutions** – the sector's institutions, including employer organizations, worker representative organizations, education and training institutions that serve the sector, research institutions, professional associations, development agencies and other development bodies interested in the sector's development, export promotion bodies, regulatory organizations and ministries with a particular interest in developing the sector or in trade or skills development
- **Evidence of comparative advantage** – assessing what evidence exists that the sector can compete effectively against international competitors

Value Chain Analysis

Industry value chain analysis shows how activities in the sector relate to each other and to activities in related sectors. They can be constructed in different ways; which is most suitable depends on the industry. While a review of the literature will highlight approaches to representing value chains that require very detailed mapping, a high level approach with limited detail, based on the literature and on information commonly known in the sector, is sufficient for the purposes of STED.

Figure 1.4: Example of a value chain based on flow of materials and goods

The most common way to structure a value chain is to follow the flow of materials, intermediate products and finished products from the producer of raw materials to the end customer. Figure 1.4 illustrates a simple representation of an agro-food processing value chain that takes this approach. In this example, the main food processing sector activities are in the Processing and Packaging stage of the chain.

A value chain representation this simple will need additional information to highlight issues that are important for the sector.

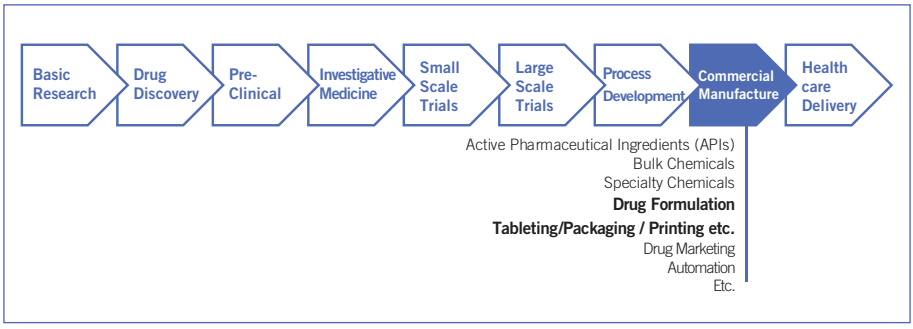
For example, some of the value chain issues that had to be explored further in the STED analysis of the agro-food sector in Bangladesh were:

- Weak "cold chain" infrastructure in inbound logistics was seen to be a barrier to getting perishable farm produce to processors.
- Product innovation and developing business relationships with international retailers were major issues.
- Finding ways for food businesses to influence and educate the farmers that supply their raw materials was seen to be important.
- There were complexities around intermediaries. As variations on the value chain shown above, in some cases, agro-food processors purchase directly from farmers, and in some cases they use intermediaries in export markets rather than selling directly to major retailers.

Issues such as these can be represented in the text discussing a value chain diagram, or can be represented by making the diagram more complex. The choice is primarily about effective communication.

Value chains can alternatively be structured around dimensions other than the flow of materials and goods. For example, in sectors where new product development is particularly central a depiction of the value chain can flow through development and commercialisation process before moving to production and servicing the market.

Figure 1.5: Example of value chain based on flow from product development through to servicing market



One sector in which this approach is commonly used internationally is the pharmaceutical sector. The STED study of the Bangladesh pharmaceutical sector adapted an existing depiction of the value chain to help analyse the sector. The adapted version is shown in figure 1.5.

This version of the value chain illustrated that, while all major pharmaceutical value chain activities are present in Bangladesh, the country's pharmaceutical sector is overwhelmingly focused on commercial manufacture. Drilling down through the main activities within commercial manufacture, it illustrated that the sector is focused chiefly on drug formulation, on tableting packaging and printing etc., as well as on marketing to the domestic market. The sector is ramping up activity in process development to produce active pharmaceutical ingredients. The value chain analysis, complemented by trade data analysis, highlighted that the sector currently imports most of its raw materials.

The value chain usefully highlights where Bangladesh's pharmaceutical sector is positioned, and provides an analytic framework in which to consider options for its future development.

Analysis of position in markets

Analysis of the sector's position in world markets is partly about establishing a coherent narrative around trade and market data analysed as part of quantitative profiling. However, this quantitative information does not tell the full story about market positioning in international or domestic markets. Key questions to address include the following.

- What are the actual products, and how do they differ from similar products produced by other countries? For example, trade data showed that Bangladesh exported "other fruit juice" in significant quantities. Interviews with agro-food businesses established that this is chiefly mango juice, and that most of what is produced is sweeter than mango juice exported by other countries making it appealing only to specific segments of the global market.
- What are the main existing destination markets for the products exported?
- How do exporting businesses address export markets? Do they have sales and service operations in-country? Do they sell through agents or distributors? Do they deal directly with large retailers or other large scale players? Do they work with mainstream distribution channels, or niche channels? Do they wait for businesses in other countries to approach them to produce goods or services on contract? Do they deal with customers in export markets through an export intermediary in their own country, or through a collaborative marketing group?
- How well do exporting businesses understand the markets to which they are selling? Do they handle marketing in-country themselves? If not, do they have enough knowledge and influence to exercise some control over pricing and marketing strategies, or do they leave market strategies mainly to local partners?

- Are the products finished goods or services for consumers? Unpackaged consumer goods that are packaged by downstream businesses? Finished goods or services for businesses? Intermediate goods or raw materials for businesses?
- Are the products branded? Is the brand controlled by the exporter? Do exporters supply retailers with "own brand" products. ("Own brand products are branded by the retailer, rather than by the manufacturer of a consumer product.)
- What form do exports take? Already packaged for consumers? Bulk? Intermediate bulk packaging?

Work organization

The way in which work is organized has a substantial impact on skills requirements, so research focused on skills should consider work organization as a significant characteristic of a sector. While it will not always be uniform across a sector, there are usually clear patterns.

A key factor to consider is the balance struck in the organization of operative level work, between:

- very narrowly defined roles that require only a narrow, rather easily learned set of technical skills, as opposed to
- more widely defined roles that may see workers taking on a variety of basic technical tasks, collaborating with others, undertaking somewhat more advanced work in areas like machine set-up and basic maintenance, and contributing to quality assurance.

STED initiatives to date have looked both at sectors such as ready-made garments in Kyrgyzstan that follow the first model, with many sewing machinists being trained quickly for very narrowly defined jobs, and at sectors where there is evidence of the latter such as in many of Bangladesh's pharmaceutical firms. Some sectors had a mix of both, for example with housekeeping workers in hotels often having very narrowly defined roles, but with front-of-house workers having more broadly defined roles that enable them to provide good customer service.

In many cases, employee turnover is significantly higher where operative work is organized around narrowly defined roles, where employers and employees have less invested in the employment relationship than where roles are defined more widely and require more investment in skills development.

The type of work organization also affects skills requirements at higher occupational levels. If work involving some knowledge is assigned to front line workers, this makes skills in collaboration and leadership important for people in management, technical and professional roles.

Similar differences in work organization can exist even in sectors where front line work is highly skilled, such as IT development, with similar implications for the breadth of skills required.

Technologies

It is important for STED analysts to have or develop a good high level understanding of the technologies used by a sector they are researching, in terms of:

- Technologies embedded in the products and services produced by the sector;
- Technologies used in production processes; and
- Information and communication technologies used by businesses.

The most important reason why understanding technologies is important is that they are one of the main factors determining the skills that a business needs, whether for its ongoing operations or for product or process innovation. This is the case across a wide range of levels of skill. For example:

- Product development typically requires people highly skilled in subdisciplines of engineering, science, design and marketing, appropriate to the industry and product. They typically require support from people with strong technician level skills.
- The skills required in manufacturing depend very much on the production technologies. Getting the most from sophisticated machinery and equipment requires that people at all levels of responsibility, from operator to production manager, have a good understanding, appropriate to their role, of how it operates. Even if production is organized so as to minimise the skills required to do operator level jobs, it is necessary for STED analysts to understand how this is achieved, and to be able to evaluate whether raising operator skill levels could allow productivity, quality or production flexibility to be improved.

Another important technology issue relates to ownership of intellectual property in the technologies embedded in products and their production. In many sectors, businesses without significant holdings of intellectual property can co-exist with major holders of intellectual property, but this may restrict the former to less profitable product markets, or may impose licensing costs that put them at a disadvantage.

Understanding the sector's technologies is also important to understanding the business environment within which the sector operates. This is addressed later.

Economic geography

Economic geography has a major influence on the competitiveness of internationally traded sectors and the businesses of which they are composed. A STED analysis should focus on two important issues.

- The quality of the infrastructure is important.
    - Transport infrastructure has a major impact on the cost of getting goods to market, on shipping times, and on whether it is even possible to get goods to market in good condition.

- The price, reliability and quality of the electricity supply is important for most sectors. Reliable supplies of other forms of energy, such as natural gas, may also be important.
- Availability and quality of clean water is important for many manufacturing sectors. It is also important that the infrastructure should be able to safely absorb waste water that has been treated to comply with the country's environmental regulations. Availability of suitable infrastructure for solid waste, whether reuse, recycling, incineration or landfill is also important.
- Reliable telecommunications infrastructure is necessary to doing business in export markets, and to participate in modern supply chains.

- Geographic concentrations of businesses make an increasingly important contribution to sector competitiveness. The most famous example is that of Silicon Valley in the US, where a large concentration of technology businesses, together with the complementary service, supplier and financing businesses that they need for success, has been one of the world's main innovation hubs for several decades.

  China provides examples more directly relevant to many countries, with many cities specialising in specific manufacturing industries. They benefit from specialisation, building up local networks of sub-suppliers that can provide better service than the distant suppliers of many of their international competitors, and can easily collaborate on product innovation and improving efficiency. Local education and training institutions can focus on addressing the specific skill needs of the industry. Ideas and know-how can circulate through shared suppliers, industry organizations, informal contacts between those working in the industry and even formal cooperation between businesses.

  A STED analysis of a sector should take account of any evidence of regional concentrations of activity and of any evidence that they benefit the sector. There are several distinct literatures on this phenomenon, talking about concepts such as clustering, industry networks, the economics of agglomeration and regional competitive advantage. A good understanding of this literature may be useful for a STED analysis.

Institutions

The sector's main institutions should be mapped, and their roles should be understood. Their existing involvement in trade development and in skills development should be summarised. Key types of institution include:

- Employer organizations
- Trade unions
- Education institutions

- Training institutions and other major providers of training
- Professional associations
- Research institutions
- Development agencies and other bodies interested in the sector's development
- Export promotion bodies
- Regulatory organizations
- Ministries of Labour, Industry, Trade, Education or Science, or other ministries that have an involvement in the sector's development

If there are already initiatives or plans in place to develop the sector generally or with a specific focus on trade or skills these should be outlined. If there are existing skills anticipation initiatives that affect the sector or existing initiatives to coordinate between stakeholders on skills development these should be described.

Evidence of comparative advantage

Understanding potential future performance in international trade is centrally important to sector analysis in an internationally traded sector. While it is necessary to consider individual components of competitiveness such as labour costs and economic geography, it is also important to understand the net outcomes of those drivers.

Among the practical objectives of STED are to find ways to improve a country's share of the global market in product categories being studied, consistent with creating more economic value for the country and generating more decent jobs and higher quality employment.

If exports and the country's exports, or share of international trade, in a product category are already growing, that provides a strong indicator that the sector's competitive position is already improving, and that measures to improve its competitiveness through skills and other interventions have a good base from which to build.

Conversely, if the country's exports are shrinking, or if import penetration is growing rapidly without compensating growth in exports, this provides evidence that the sector is losing competitiveness, and that the initial challenge is to slow and halt the loss, before it can be reversed.

It is important to be conscious that losing out in a sector and a market is not always bad for a country. Trade is driven by the economic benefits of specialisation, so while economic diversity is valuable its benefits are greatest in sectors that are capable of being competitive, and in which the country can develop or maintain a comparative advantage.

1.3 BUSINESS ENVIRONMENT

Analysis of the business environment of an industry is a basic staple of business strategy, and there is little difference between doing it for an individual business and for a sector made up of broadly similar businesses within a single country. Most of the approach to analysis of the business environment outlined here is similar to that described in many texts on business strategy.

Research into the business environment is described under the following headings:

- Scanning the business environment
- World market trends
- Industry competitive analysis
- Drivers of change

The analysis of a sector's business environment will identify large amounts of detail, and in many cases issues will appear in analysis undertaken under more than one of these headings. The objective of analysing the business environment is to identify the issues that will be most significant for the future, so it is important that any report write-up on the business environment should be quite selective in what it uses, and should avoid repetition.

1.3.1 Scanning the business environment

When scanning for issues in the business environment that may be relevant to the future of the sector, it is useful to have a checklist to work from. There are slight variations in how these checklists are formulated in the case of STED analyses, but they generally include the following types of issue.

- Political
- Economic
- Social
- Technological
- Environmental
- Legal

This list of types of issues should be used as a set of prompts to finding the right questions to ask, and as a starting point for thinking creatively about the issues that will affect the sector's future.

Examples of issues that have emerged from this sort of scan in the pilot STED initiatives undertaken to date include those set out in Table 1.2.

Table 1.2: Examples of business environment issues from STED pilot initiatives

Type of Issue	Sample Issues
Political	● As work on the STED analysis of pharmaceutical and agro-food sectors in Bangladesh was underway, a new national Skills Development Policy was approved by the Government, having been developed with assistance from the ILO TVET Reform Project. Political issues around agreements on trade were significant for several of the sectors studied in STED pilot countries, whether in terms of commitments arising from membership of the WTO or in terms of preferential access to EU markets or joining a customs union. Issues around preferences in market access and around differences between competing countries in tariffs on raw materials arose repeatedly.
Economic	● Developments in exchange rates and wage inflation have been seen to have a major impact on competitiveness across a number of sectors studied, both relative to destination markets, and relative to competitors selling similar products to the same countries.
Social	● STED research into the garment sector in Kyrgyzstan found evidence of substantial emigration to work in the garment sectors of neighbouring countries. ● Seasonality of work in hotel sectors studied in the FYR of Macedonia and Ukraine has a major impact on stability of employment, which in turn impacts on the returns that hotel businesses can get on investment in training of non-permanent staff.
Technological	● Technological and process innovation, and adoption of new technologies, was found to be a key driver of export success in most sectors studied, including metallurgy (Ukraine), garment manufacture (Kyrgyzstan), food processing (FYR Macedonia and Bangladesh) and pharmaceuticals (Bangladesh). Weaknesses in these areas were seen to hold some sectors back.
Environmental	● Stronger environmental regulation in India and China is giving industries in Bangladesh a potential cost advantage, although one that may cause reputational problems. ● Overfishing in Lake Ohrid and damage to spawning beds makes it difficult to develop sport fishing as an off-season activity in one of FYR Macedonia's main holiday destinations.
Legal	● Studies of agro-food and pharmaceutical sectors found that regulations in destination markets play a major role in market access.

When scanning the business environment, it is useful to draw on existing studies and surveys of the business environment in the country being studied.

Sources that are typically useful for this include:

- ILO Enabling Environment for Sustainable Enterprise (EESE) studies.
- World Bank Business Environment and Enterprise Performance Surveys (BEEPS).
- World Bank Doing Business Rankings (DBR).
- World Economic Forum Global Competitiveness Report.
- OECD country and regional studies.
- MIT and Harvard's Atlas of Economic Complexity.
- Other existing studies of the country and of the sector being studied, which may have been prepared for any of a wide range of international organizations or other bodies in the development community.

It is also important to draw on primary information from the country concerned, from local ILO staff, from ILO constituents and other partner organizations contributing to the STED research, and from primary research through workshops, interviews and surveys.

1.3.2 World market trends

In addition to analysing how the sector is positioned in global markets and how its exports and imports have developed, it is important to look at the market as a whole, i.e. at overall market growth, at where demand is located, and at where market growth is concentrated.

Two main types of information sources can be used – trade data and information from market research. It is preferable to investigate both. In some cases, also, studies by international bodies such as the World Bank, FAO, OECD or European Commission include market information not available from other sources. Trade data has the following significant features.

- It is almost universally available in standard formats and using standard coding systems, although the most recent data may only be available from sources within the country;
- It is generally available without charge;
- While it does not cover the whole of each market (in that it does not capture sales by domestic producers), it covers the internationally traded part of the market that may be most accessible to exporters from the sector being studied.
- While data on goods is available at a high level of detail, data on trade in services is much less detailed, and may not have sufficient detail to be useful for a study

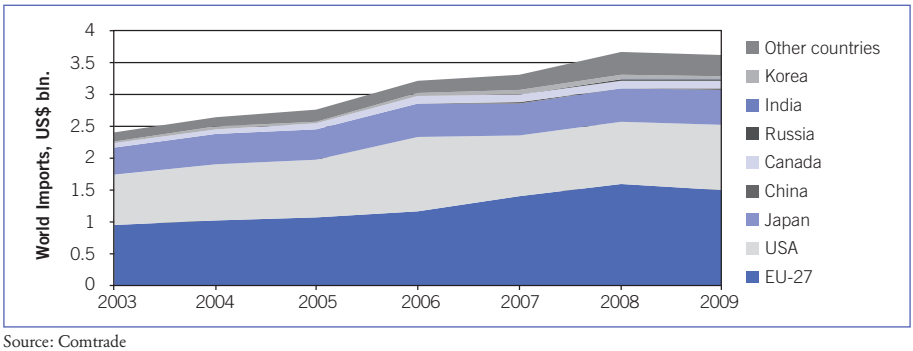
of a services sector. In some cases, alternative sources of official data may be useful in the case of service sectors, such as, for example, numbers of tourist arrivals and bed nights in the case of hotel sectors.

In contrast, market research has the following significant features.

- It is produced by commercial market research organizations, and sometimes by industry organizations based on industry definitions and product categories that are meaningful to the industry, but do not necessarily match standard statistical definitions.
- The cost involved in gaining full access to market research can be significant, and it is usually not clear until after it has been paid whether it will make a sufficiently useful contribution to the research to justify paying it. For this reason, it is usually most feasible to use summary information that has been made available freely (e.g. through press releases), market research reports that are available on a subscription service to which the organization already has access, and information from partner industry organizations that produce or have access to the market research.
- It includes qualitative information that may assist in understanding trends.
- Market research data typically covers the whole market, rather than just the part that is internationally traded. This can be useful, alongside trade data, for understanding international markets. It is very useful for understanding the domestically-supplied part of the home market of the sector being studied, which is not covered by trade data.
- There may be copyright obstacles to republishing market research data.

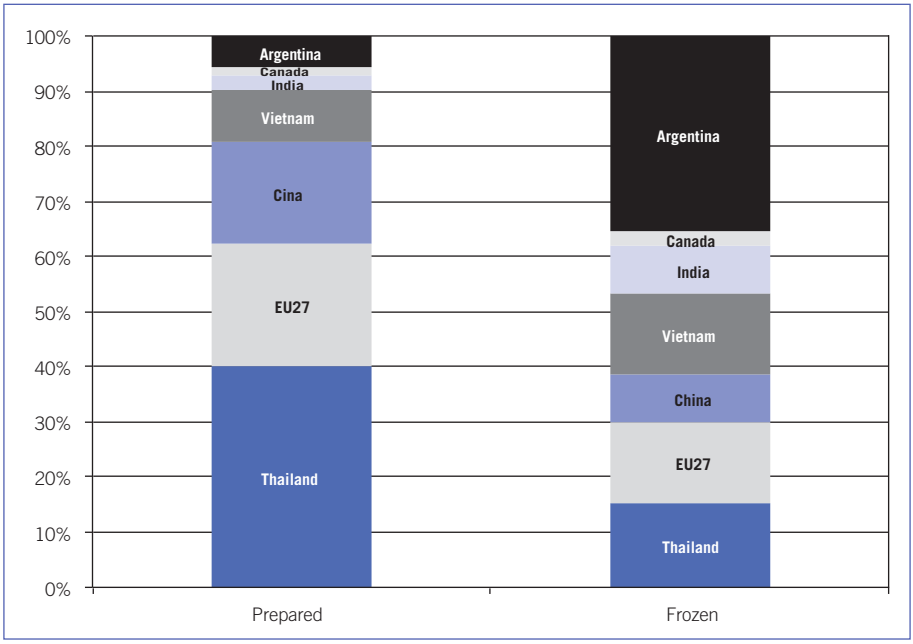
Based on all these considerations, STED research should generally take account of both trade data and market research data on market trends, but focus particularly on the trade data. Data and charts in the published report will usually draw mainly on trade data. Simple examples are shown in Figures 1.6 and 1.7.

Figure 1.6: World demand for frozen shrimp



Source: Comtrade

Figure 1.7: World suppliers of imported frozen and prepared shrimp



Source: Comtrade

More complex analyses can be developed to explore and illustrate hypotheses on market developments that emerge from the research. Figure 1.8 provides an example of such an analysis, which looks at market growth for countries at different income levels for various categories of pharmaceuticals. It was used to highlight how market growth is greatest in low income countries, which are a major target for Bangladesh's pharmaceutical sector.

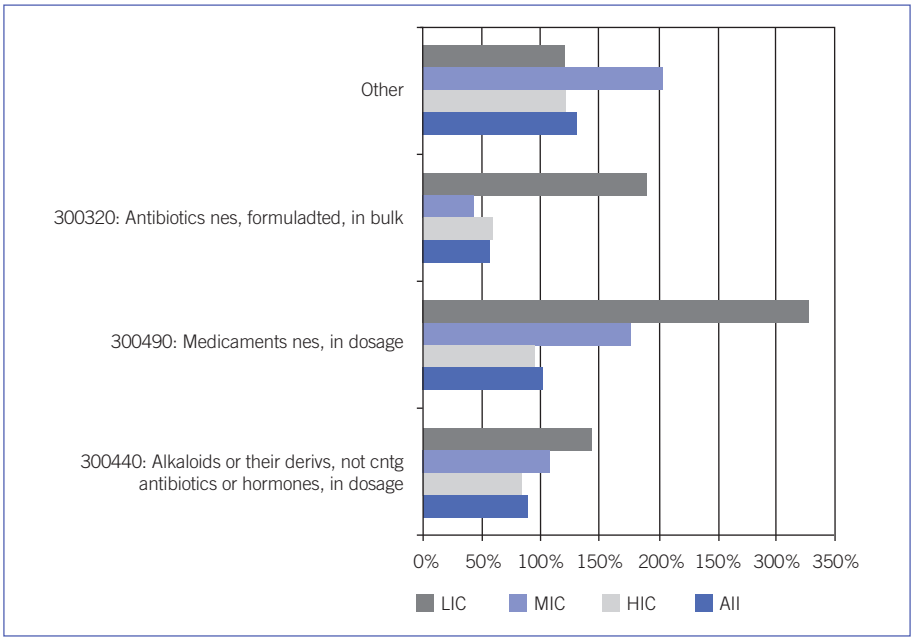
1.3.3 Position in world markets

In addition to understanding trends in world markets, it is necessary to understand how the sector fits into those markets, and how its position in the markets is evolving. Key questions include the following.

- How do the markets addressed by the sector differ from the markets for other exporting countries, and why are they different? Is it a matter of geography? Matching consumer preferences? Regulations? Pricing? Trade barriers or tariff differences? Compliance with standards for quality or good practice? Business networks?

  For example, many of the visitors served by the tourism sector in FYR Macedonia come from nearby countries, particularly other countries formerly part of Yugoslavia, while relatively few come from higher income European countries

Figure 1.8: Growth in demand for imported pharmaceuticals 2003 to 2009, for countries in three income bands (lower, middle, high, based on World Bank definitions)



Source: Comtrade

or from countries outside the EU. This contrasts with the tourism sectors of many other European countries that mainly serve higher income European countries and get significant numbers of visitors from outside Europe.

- How are the products positioned relative to others in the main markets? Low cost, good quality? Low cost, market perception of unreliable quality? Premium? Undifferentiated from competitors?

  For example, Kyrgyzstan's clothing sector sells principally to Russia and to other nearby CIS countries. Businesses sell mainly on the basis of low costs, underpinned by low labour costs and a favourable tariff regime for importing raw materials and exporting to its main markets. They make use of ethnic sales channels, giving them a particular presence among small clothing retailers and in indoor and street markets. They copy many of their designs from product lines that are already successful in the market, and can bring a new product line into production rapidly to respond very quickly to changes in what the market wants. Their low price positioning is broadly similar to that of the clothing sectors of China and Turkey with which they compete most directly, but differs in placing less emphasis on factors that facilitate moving up market such as original design and professional marketing.

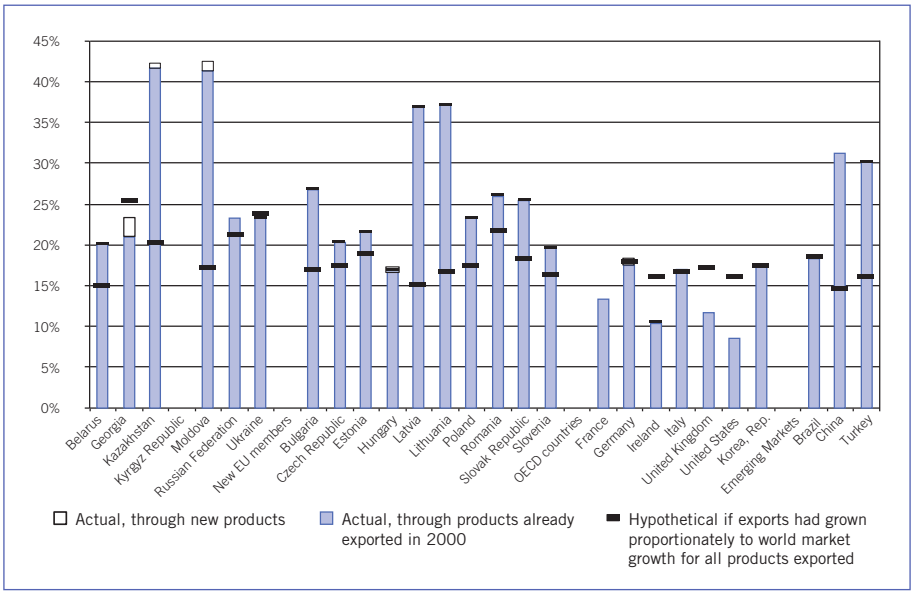
It is possible to use data on markets and tariffs to analyse and illustrate how the country and the specific sector being researched are positioned relative to other countries. As the issues to be addressed vary between countries and sectors, it is not possible to be prescriptive about what analysis should be undertaken. It should, rather, be driven by issues that emerge from the research. STED analysts should approach this in an inquisitve and imaginative way.

Figures 1.9 and 1.10 show examples of this sort of analysis from the pilot studies on the Ukrainian metals sector and the Kyrgyz garment sector.

Figure 1.9 provides a new perspective on the observed strong growth of Ukrainian Metal Exports by comparing actual export growth with the expansion of the world market for the exported products. Unlike many successful emerging exporters, Ukraine did not manage to increase the world market share of its metal products. Strong growth was driven by a rapid expansion of world market demand for its products, which came to an abrupt halt in 2008/9.

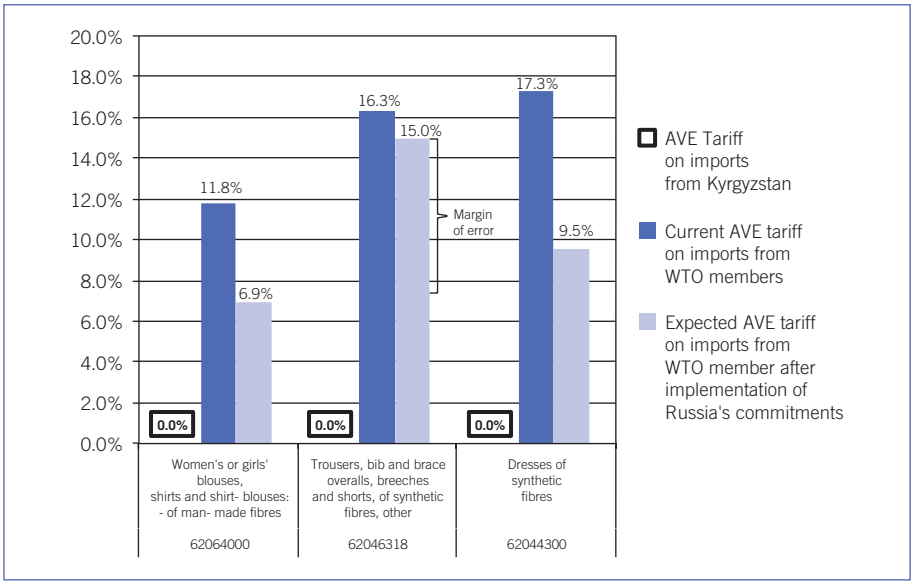
Figure 1.10 shows that Russia's accession to the WTO is likely to lead to a substantial deterioration of the market position of Kyrgyz exporters due to preference erosion. Currently, Kyrgyz producers can export garments to Russia tariff free, while its main competitors such as China and Turkey face significant tariff barriers. These will be reduced substantially with Russia's accession to the WTO.

Figure 1.9: Exports of Articles in Chapter HS73 (Articles of Iron and Steel) vs. Market Growth (2000-2008)



Source: ILO (2010): Promoting Economic Diversity in Ukraine: The role of the business enabling environment, skills policies and export promotion.

Figure 1.10: Preference Erosion for Kyrgyz Garment Producers after Russia's WTO Accession



An AVE (Ad-Valorem Equivalent) Tariff is a tariff expressed as a percentage of the value of goods cleared through customs,

Source: ILO (2012): Skills for Trade and Economic Diversification in the Kyrgyz Garment Sector. This chart is based in data from the ITC Market Access Map, Russia's WTO accession documents and calculations by the team responsible for the Kyrgyz study.

1.3.4 Industry competitive analysis

Industry competitive analysis is about understanding competitive pressures and collaborative relationships within an industry, and between the industry and other industries that affect it.

In the context of STED, it focuses on:

- Dynamics of competition between businesses in the sector being studied.

  How intensely do they compete with each other? Is their competition primarily in the home market, or do they compete in other markets too? To what extent are they in direct competition with each other, as opposed to being focused on different market segments or geographic areas? To what extent is competition focused on price, and to what extent on non-price factors such as quality, service, differentiated products, marketing activity, distribution channels or location?

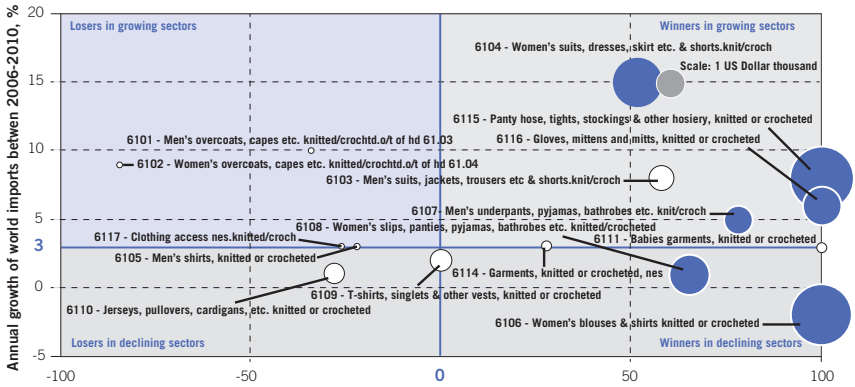
Box 1.2: ITC online trade analysis tools

In addition to performing their own analysis using COMTRADE bilateral trade database, STED analysts can benefit from the stock of available user-friendly on-line-tools such as a TradeMap and a MacMap in their analysis of sector position and outlook. Developed by International Trade Centre (ITC), TradeMap and MacMap are useful strategic market research and trade analysis tools which can be accessed through a web account. TradeMap and MacMap provide detailed export and import profiles and trends for over 200 countries in a user-friendly format at different product levels of the Harmonised System (HS) of Product Classification. They can be used to analyze markets, select priority sectors of a country for export diversification analysis, review the position and performance of sectors, and assess opportunities for market and product diversification by identifying existing and potential trade between countries. TradeMap and MacMap's underlying trade and tariff database comes from COMTRADE. TradeMap and MacMap can be accessed at the following addresses:

http://www.macmap.org/ and http://www.trademap.org/.

The following is an example that was produced by using ITC MacMap tool. The bubble chart is used to position Kyrgyzstan's products of HS chapter 61 (Articles of apparels, accessories) according to their growth rates and changes in market share. As may be seen here, Kyrgyzstan has a number of internationally dynamic products in which the country is gaining world market share, and even has a number of achievers in adversity (where Kyrgyzstan exporters have been successful despite sluggish growth of world trade) in the leading export products of HS Section 61 (Articles of apparels, accessories).

Growth of national supply and international demand for export products of Kyrgyzstan - 2012



Somme bubbles may not be displayed due to lack of growth rate indicators
The bubble size is proportionnal to export value

Is it possible to group firms in the sector by size, sophistication, quality of management or other characteristics? If so, is there evidence that larger, more sophisticated or better managed firms perform better in the market, or are more likely to export?

- Dynamics of collaboration between businesses within the sector being studied

  The extent to which businesses within a sector collaborate should be studied. While collaboration can be a source of weakness if it reduces competitive pressure to improve and innovate, it can also be a source of strength if it enables firms in the sector to make strategically important moves that they could not make independently. Working with government and providers of education and training, upgrading product quality, overseas marketing, procurement from major suppliers and product development are some of the areas where collaboration can be beneficial.

- Dynamics of competition between businesses in the sector being studied and their international competitors.

  It is helpful to consider the sector's home market, the home markets of the international competitors and markets that are export markets for both, separately.

  International competitor sectors should be segmented between sectors that are similar, and are competing most directly for the same customers, and those that are different, using different strategies to target different customers. It is important to understand how competition operates within and between these segments. In many cases, exporting sectors in developing countries have a low cost positioning, and compete for more price sensitive customers. Sometimes they compete more directly against similar sectors in other developing countries than against incumbents in developed country markets; sometimes taking market share from incumbents with higher costs. In some cases, they succeed in developing a premium or differentiated positioning, such as with extra-large freshwater shrimp from Bangladesh.

- Dynamics of collaboration between businesses in the sector being studied and their international competitors.

  Collaboration with similar sectors from other countries can be beneficial. In many cases, there is scope for businesses in a developing country to collaborate with businesses in the same sector in a developed country. The developed country businesses benefit from being able to outsource production or other activities to a reliable partner with lower production costs. The developing country businesses get access to high value markets and to advice and practical assistance with improving their own operations and business practices.

- Competitive and collaborative dynamics of supplier relationships.

There is a tension in a sector's relationships with suppliers between competing to secure the most favourable deal in terms of prices and levels of quality and service, and collaborating to increase the level of value created to the benefit of both the sector's firms and their suppliers. This is a major issue for exporting industries, whose competitiveness can be damaged by high input costs if they obtain less favourable terms than their international competitors, but who can benefit greatly from collaboration with suppliers on innovation and responsiveness and from competitive pricing. Having a capable local supply base facilitates collaboration, and this can be a major source of competitive advantage.

- Competitive and collaborative dynamics of customer relationships.

  Just as with supplier relationships, there is a tension in a sector's relationships with its customers between competing to secure the most favourable deal in terms of prices and levels of quality and service, and collaborating to increase the level of value created to the benefit of both the sector's firms and their customers. Even so, collaboration with customers, or with intermediaries that have access to customers, is essential for sustained market access for most exporting sectors. Selling to an export market based purely on low prices with weak customer relationships can work for a period, but the exporter misses out on the market information needed to inform pricing, product improvement and market strategies, and to ensure that the interests of intermediaries are aligned with the interests of the exporter.

- Competitive pressure from new entrant sectors.

  In many cases, sectors studied through STED are in product markets in which similar sectors from a number of countries are endeavouring to start exporting, or to grow exports from a low base. In addition to considering existing competitors in international markets, STED analysts should investigate where new entrant sectors may come from, what their market strategies are likely to be, and what degree of competitive challenge they are likely to pose.

- Competitive pressure from substitute products or services.

  The possibility that a substitute for a key product or service may emerge, or become economically viable, should be investigated. An artificial or synthetic product may emerge as an effective substitute for a natural product. Advances in logistics may make it possible to substitute a fresh product to market for one that is frozen or preserved. A new treatment may emerge for a medical condition, making products associated with the existing treatment obsolete. A new construction technique may substitute demand for existing types of construction material with demand for new materials.

  In many cases, the substitute product only becomes viable when some threshold is reached, such as a lower cost for the new product, a higher cost for the existing product, a change in regulations or a shift in consumer tastes.

> The purpose in looking into possible substitute products and services as part of a STED analysis is to scan for substitutes that may already be visible to people knowledgeable about the sector. It is not to undertake a detailed assessment of all the substitutes that could possibly be relevant.

While it is necessary for STED research to examine all these issues, there is no need for a STED report to go laboriously through each heading. All that is needed is to highlight the key issues identified.

1.3.5 Drivers of change

Analysis of drivers of change is quite a standard feature of sectoral studies, whatever the purpose for which they are undertaken. Drivers of change are factors likely to have a significant impact on future developments in the sector. The drivers-of-change analysis is one of the main features of a sectoral study that enables the analysis to take a forward looking perspective.

In the context of STED, the analysis of drivers of change should start by reviewing the business environment scan, the review of world market trends and the industry competitive analysis. It should also draw on lists of drivers of change from existing reports on the sector, both country-specific reports and reports on the sector internationally.

The researchers should go through a brainstorming exercise, drawing on all the research undertaken, to identify additional drivers that should possibly be included in the list. This is an important opportunity to identify issues that have not previously been highlighted as important in the literature on the sector, whether because the existing research base is limited, or because the skills and trade emphasis of STED has brought a new perspective to bear.

Based on the review and the brainstorming exercise, it should develop a preliminary list of drivers of change. If the work behind the preliminary list has been sufficiently wide ranging and creative, it is likely that some effort will then be required to:

- Group closely related issues together into single drivers;
- Eliminate unnecessary repetition of content between drivers;
- Sharpen the analysis, where the initial understanding of a driver may not be exactly correct, or where it has not been expressed clearly; and
- Remove drivers which, on further consideration, are less important than was originally thought, or are invalid.

In a report, drivers of change are typically presented as a list of drivers, with a description of each. In a STED report on a sector, the researchers may decide that material that would be included in a complete list of drivers of change is needed under another heading. They should avoid repetition – the objective when preparing

content on drivers is for the report as a whole to communicate a good understanding of the issues, not to provide a discussion of drivers capable of standing alone.

1.4 SUMMARISING

1.4.1 SWOT

STED analysts should draw together strategically important conclusions from their work on characterising the sector and analysing the business environment. The popular SWOT (strengths, weaknesses, opportunities, threats) framework can be used for part of this summary.

The SWOT framework is a 2x2 matrix in which the sector's competitive strengths and weaknesses are listed in the top row, and in which the opportunities and threats posed by the business environment are listed in the second row. If the SWOT analysis is included in the report, it will generally need some supporting text to explain and support the main points listed in the framework.

SWOT summaries are only as good as the analysis that underpins them, so it is important that STED analysts should not bypass the much more detailed analysis described earlier. Experience shows that the SWOT framework is primarily useful for summarising the findings of more extensive and detailed sectoral research. While researchers can make an attempt at filling in the SWOT framework for a sector without substantial research, the results of doing so can be very unsatisfactory.

Figure 1.11: The SWOT framework – example based on STED study of Kyrgyz ready-made garment sector

Strengths	**Weaknesses**
Low labour costs Favourable tariff arrangements for raw materials and for access to Russian Market Access to distribution through diaspora	High level of business informality Shortages of mid and high level skills Weak skills development leading to skills deficiencies Management weaknesses
Opportunities	**Threats**
Access to existing markets (primarily Russia) to improve as customs union eliminates non-tariff barriers	Preference erosion from tariff changes arising from trade agreements to strengthen competition from nearby countries and China in main markets Garment workers leaving for more attractive jobs in Kazakhstan

1.4.2 Comparative advantage

In addition to the SWOT-style summary, it is useful also to draw conclusions about future prospects for the sector's comparative advantage, or, equivalently, for the sector's competitive success in export and domestic markets.

Sector characterization will already have assessed the existing position with comparative advantage. It is necessary to also:

- Consider the evidence on how comparative advantage is evolving; and
- Assess what implications the analysis of the business environment has for future developments in competitiveness, and to get a sense from this as to how future sales could develop in both export and domestic markets.

1.5 ENVISIONING THE FUTURE

All the work done on characterizing the sector and analysing its business environment is undertaken to provide a sound basis for taking a forward looking view on the sector. The first step in taking this forward looking view is to envision how the sector may develop into the future. At this point in the STED methodology, the exercise is mainly qualitative, but an attempt is made to quantify the preferred vision of the future later, in Stage 4.

1.5.1 Scenario development and choice

The approach STED takes is scenario-based[9] – developing a number of different alternative scenarios as to how the future of the sector may play out. STED analysts then work with stakeholders in the sector to choose a scenario that reflects how they would like the sector to develop into the future.

There is no hard limit to the number of scenarios that can be considered, but as a guideline the number should usually be at least three and no more than five. Fewer than three will yield inadequate variety. As the number of scenarios increases, they become more difficult to manage, and the risk increases that variety will be created in order to cover all possible outcomes without adding to the understanding that comes from them.

[9] There is a large literature on scenario methods, much of which favours scenarios that seek to imaginatively explore future outcomes, with a heavy emphasis on qualitative understanding across a range of dimensions, many of them outside the control of those commissioning the analysis. The approach taken within STED is narrower, but still within the bounds of scenario analysis. Much of the focus is on factors within the control of the sector's stakeholders, and on linking these to plausible outcomes. As the scenarios are intended to be paired with projections of exports, linked through to employment, they are usually designed so that they will look different to each other when translated into quantitative terms. This is not usually a constraint that the more open-ended approaches to scenario analysis face.

The scenarios look to the medium term future – of the order of five years – long enough to take actions and see an impact, and short enough to retain a connection to the present.

Three basic types of scenario are usually useful:

- A "Business as Usual" scenario, based on following the existing growth trajectory, based on existing products and existing markets.
- A "Same but More" scenario, based on stepping up the effort to export existing products to the same markets and to similar markets.
- An "Upgrade the Sector" scenario, based on elements such as developing new products, accessing new markets, better value chain integration, or a major improvement in customer quality perceptions or branding.

Additional scenarios can be used to explore different paths towards upgrading the sector. Key areas where different choices may be viable include:

- Choice of target markets
- Choice of products
- Positioning within the market – low cost; premium; differentiated in some way; branded/unbranded
- Channels to market – sales force in country; agents; distributors; joining supply chains of businesses in the market without establishing a local presence
- Extent of reliance on foreign direct investment or partnering with international businesses

Once a number of scenarios have been outlined, it is necessary to develop the specifics in more detail, answering questions such as the following:

- What are the main assumptions about market developments – particularly about market growth and pricing? How likely is it that markets will develop broadly as assumed?
- What are the main assumptions about competition in markets? How competitive can the sector be in the face of competition in export markets? How competitive can it be in its home market?
- In broad terms, what outcomes does the sector hope to achieve? In rough quantitative terms, what does this mean for export growth, and for sales to the domestic market? Where, broadly, are the sales to be achieved, and with what products?
- Broadly, what actions can the sector take to achieve the outcomes described in the scenario? How realistic is this?
- Reviewing the analysis conducted on the sector's characteristics (1.2) and its business environment (1.3), are there other significant issues that should be reflected in the scenarios?

In addition to adding detail to the scenarios, these questions may also suggest variant scenarios that should be considered, taking account of issues, such as for example:

- A more or less challenging competitive environment;
- Whether or not a proposed trade agreement that changes the competitive environment is implemented; or
- How customers and competitors will respond to a new market entrant.

Having developed a set of coherent scenarios, the next step is to work with stakeholders to choose a preferred scenario to provide the basis for the STED strategy. In STED pilots undertaken to date, this has been achieved through stakeholder workshops and through involving some stakeholders in the work more directly.

In some cases, there will be an existing plan for the sector, developed by the sector itself (or major businesses), by the country's government, or through a joint effort by stakeholders. The plan may be published or unpublished, and may be more of a shared understanding than a single document. In other cases, the leading businesses in the sector may have existing strategies for developing export markets, and for competing effectively against imports in the domestic market, that represent a strategy for their part of the sector. As larger businesses are more likely to export, and as smaller businesses often copy their strategies, this may amount to a plan for the sector, even if it is not perceived that way by the sector.

Based on experience from the STED pilots that have been undertaken, the scenario development process can usefully take account of existing plans such as these, and it will often make sense for stakeholders to choose a preferred scenario that is consistent with existing plans.

The evidence of the STED pilots is that the sector characterization, businesses environment analysis and scenario formation aspects of STED are necessary even where there is an existing plan that has stakeholder buy-in. It typically brings fresh evidence to bear, provides a fresh and external perspective, adds depth and/or breadth to the analysis, and provides a much sharper focus on skills and trade issues than is present in the existing plan.

Box 1.3: Examples of pre-existing sectoral plans

Examples of existing plans seen in STED pilots included:

- The National Tourism Development Strategy for the FYR of Macedonia
- A consensus between pharmaceutical industry associations and the government of Bangladesh, with no published strategy
- Existing export plans of major Bangladesh food businesses

1.5.2 From preferred scenario to vision

A vision of the future is an important part of any strategy. It sketches a picture of the desired outcome.

Some of the elements that may be covered by a vision include the following.

- Products and markets
- Sources of competitive advantage
- Technology
- Distribution channels
- Work organization
- Anticipated outcomes, drawn in broad terms

The vision provides a forward looking benchmark against which it can assess future skills needs, and the training and other measures required to provide for them. Box 1.4 provides an example of a sector vision, based on STED work in Bangladesh.

Box 1.4: Example of a sectoral vision

Key elements of the vision for agro-food exports from Bangladesh were as follows.

- Continued incremental growth in exports of ethnic Bangladeshi products to existingand similar markets, continuing to use intermediaries in diaspora network for distribution
- Entry into export markets in developed and middle income countries with mainstream products based on raw materials from Bangladesh's agricultural and aquaculture sectors, including mango juice, other processed fruit products, prepared shrimp products and other products that may be identified by agro-food businesses.
- Competitive advantage based on combination of raising food sector operational, technological and business standards to international levels and cost advantages with raw materials and cost of processing.
- In mainstream markets
  - o Dealing directly with major retailers and retailer groups, initially focusing on supplying retailers' "own brands"
  - o Selling in bulk for packaging by other businesses
  - o Supplying ingredients to other food processing businesses
- Exports of ethnic foods to grow at a moderate rate, mainly reflecting growth in numbers of Bangladeshis working outside the country. Exports of mainstream products to grow rapidly from a low base.
- Impact on rural population to be positive, providing opportunities to move from subsistence to market-oriented farming, and providing markets for products that go to waste at times of glut. Farmer education necessary for strategy to work.

1.6 CHECKLIST FOR STAGE 1: SECTOR POSITION AND OUTLOOK

When Stage 1 is complete, STED analysts …

		Importance
… should have done the following:	Established a clear working definition of the sector	Required
	Profiled the sector quantitatively based on statistics	Required but may limited by data availability
	Researched the sector qualitatively, looking at the industry value chain, position in markets, technologies, economic geography and evidence of comparative advantage	Scoping research required. More depth where significant issues are apparent.
	Scanned the sector's business environment	Required – but focused on most significant issues
	Analysed world market trends using trade data and market research data	Trade data analysis Market research where information easily available
	Undertaken a competitive analysis of the sector	Scoping research required. More depth where significant issues are apparent.
	Identified the sector's main drivers of change	Required – but focused on most significant issues
	Developed scenarios for the future development of the sector, and chosen a preferred scenario	Required
	Developed a vision for the future of the sector	Required
… should have produced the following outputs:	Statistical profile of sector	Required, within limitations of available data
	Descriptive profile of sector	Required – but focus on most significant issues
	Analysis of business environment, and of the sector's place in its environment	Required – but focus on most significant issues
	Summary of issues from sector characterisation and analysis of business environment	Required
	Description of the vision for the future of the sector	Required
	Future comparative advantage of sector	Required
… should have used the following information sources:	See detail on sources of data in chapter on Stage1	Required Which data sources can be used depends on data availability

STAGE 2: BUSINESS CAPABILITY IMPLICATIONS

2.1 BUSINESS CAPABILITIES

A business capability is something significant that businesses can do that contributes to their ability to achieve their objectives[10]. A sector's business capabilities chiefly lie in the capabilities of its own firms, but the capabilities of local suppliers, service providers, regulators, research institutions and other complementary types of organization often also contribute business capabilities, either by themselves or in combination with the sector's firms. Business capabilities are characteristics of organizations, not of the workers they employ.

All sectors have existing business capabilities, built up from the technologies they use, the manufacturing and business process they apply, the skills of their workers, their forms of work organization, and the infrastructure to which they have access, among other factors.

STED uses the business capability concept to bridge between a vision of the future (from Stage 1) and the skills needs that follow from this (Stage 3). The logic goes:

1. "We want to achieve the vision" (This is developed in Stage 1.)

[10] The business studies literature includes extensive discussion about the proper meaning of the term capability, of related organization level terms that include *capacity* and *competency*, and of the distinctions that the use of each term implies. The literature also includes extensive discussion about these terms applied at the level of the individual or the team that intersect with discussions of the meaning of terms such as *skill* and *competence*. The term *business capability* is used here to clarify that the capabilities under consideration are at the level of the business, not at the level of the individual or team. When choosing between the terms *capability*, *capacity* and *competency* for purposes of STED, it was recognised that none of these is used with a consistent meaning in business, and that there is an extent to which they are used interchangeably. *Capability* was preferred for STED because when used at business level it seems to be the term most often associated with addessing "What can be done?", where *capacity* often addresses "How much can be done?", and *competency* is often used to refer to more abstract matters such as being good with a particular type of technology or customer experience. It is not suggested that it is necessary to follow this choice of terminology outside the context of STED.

2. "In order to achieve the vision we need to be able to do these things well that we cannot do adequately yet." (These are gaps in business capabilities identified in Stage 2)
3. "In order to be able to do these things, we need these skills." (These are implications for types of skills needs that are identified in Stage 3.)

STED focuses on *gaps* in business capabilities, rather than on trying to enumerate all business capabilities, because where there is no gap the sector can already do what is required for success with its existing base of skills. Enumerating all of the sector's business capabilities would greatly increase the work involved, without significantly improving the analysis.

Even where an existing business capability is broadly adequate, there may still be some skills deficiencies to be tackled. These are picked up later in the analysis.

2.2 IDENTIFYING GAPS IN BUSINESS CAPABILITIES

Identifying gaps in business capabilities is about identifying the main areas of capability that must be created or greatly improved if the vision for the sector is to be achieved. Some of these are likely to already be understood well by the sector's stakeholders; others should come from thinking through the implications of the sector analysis logically. Once a draft list of business capability gaps has been prepared, it must be checked and improved through discussion with stakeholders. So far, this has been achieved as part of stakeholder workshops.

Developing a good draft list of business capability gaps requires knowledge of the sector, and of the competitive and practical challenges it faces in achieving the vision. It requires knowledge of international business practices that will apply in export markets, and the ability to evaluate where the sector currently stands relative to these.

It requires a significant degree of creativity too, tempered by judgement. In many cases, STED analysts will not be sure how big a gap there is between the sector's business capability in an area and what is needed for export success before consulting stakeholders. They have to bring some imagination to bear to identify the best candidates, and later make use of stakeholder inputs to ensure the analysis is grounded in reality. If they are overly cautious, there is a risk that they will miss important gaps, and that the gaps will not surface in the stakeholder consultation.

It is not possible to provide a complete list of areas where there may be gaps in a sector's business capabilities, but the table below provides a checklist of possibilities to use. Cross-referencing these against the main elements of the vision will highlight business capabilities that are directly relevant to achieving the vision. Assessing whether each of these relevant business capabilities is already present, and if so how strong it is, will highlight gaps in business capabilities essential to achieving the vision.

The checklist is not comprehensive. Other areas of capability may arise when considering what capabilities are required to achieve the vision.

Table 2.1: Checklist of possible gaps in business capabilities (not comprehensive)

	Tick
Operations	
• Efficiency / costs / working capital requirements	☐
• Quality	☐
• Responsiveness / delivery times / product variety	☐
• Implement regulatory requirements within operations (Improvements come from changes in technology, skills and processes)	☐
Product development (including technology transfer)	
• Products new to firm	☐
• Product improvement	☐
• Product innovation	☐
Sales and marketing	
• Domestic market	☐
• Export consumer marketing	☐
• Export business-to-business sales, marketing, relationship management	☐
• Export channel management and management of export intermediaries	☐
• Product management	☐
• After-sales service	☐
Compliance with regulatory requirements (and quasi-regulatory customer specifications)	
• Regulatory affairs (gaining approvals, management of compliance)	☐
• Domestic regulatory compliance	☐
• Regulatory compliance for export markets	☐
Sourcing	
• Developing local supplier base	☐
• Sourcing from most suitable international suppliers (cost, responsiveness, quality)	☐
• Managing supplier relationships	☐
• On-going purchasing operations	☐
Logistics	
• Inward logistics – domestic sources, import sources	☐
• Outward logistics – domestic, export	☐
Other business functions	
• Human resource management, recruitment, development systems	☐
• Financial and treasury management	☐
• Corporate affairs – relations with government and other stakeholders	☐
• Information technology	☐
Value chain	
• Improving other components of value chain	☐
• Reconfiguring the value chain	☐

Most of the business capability areas in the checklist should be self-explanatory, but the following may not be immediately familiar.

- Product management is concerned with managing all aspects of a product or group of products, from the decision to develop a product to pricing and marketing activity once it is on the market.
- The *value chain* areas refer back to the value chain analysis conducted in Stage 1.
    - There may be a need to strengthen a part of the sector's value chain that lies outside the sector, in order to develop a business capability that the sector needs. For example, in the STED study on the pharmaceutical sector in Bangladesh, a need was identified to develop a stronger capability in clinical trials.
    - There may be a need to reconfigure the established value chain in a sector for success. For example, many exporting sectors in developing countries succeed in part through providing outsourced manufacturing or service capacity to developed country firms that previously did the work internally.

The business capability areas in the checklist are generic. They should be tailored to the sector and to the vision. Doing this may, for example, involve:

- Identifying technologies or types of product, regulatory issues specific to the sector, or specific types of supplier, customer or distribution channel;
- Combining business capabilities that are related, whether because they are in the same group above, or because in practice they are carried out by the same people.[11]

As an example, Box 2.1 summarises the business capability gaps identified in the two sectors studied in Bangladesh.

[11] For example, in regulated sectors responsibility for managing regulatory affairs might be a specialist function that works closely with several distinct parts of the organization, or might be aligned closely with operations.

Box 2.1: Business capability gaps identified in agro-food and pharmaceuticals in Bangladesh

Among the four STED pilots undertaken, the analysis of business capability gaps was first employed explicitly in the Bangladesh pilot. Seven important business capability gaps were identified for each of the two sectors.

There is significant overlap. This may be because both are based in the same country, and serve markets that tend to be highly regulated. Some of the areas of overlap may also point towards capability gaps that are common among sectors in low-income countries that are in the early stages of developing export markets.

Agro-food sector business capability gaps – need new or much stronger capabilities in the following areas

- Export marketing, product management, channel management
- Supplier capabilities (farmers and aquaculturists)
- Product development
- Operational effectiveness and food safety
- Regulatory compliance
- Logistics / supply chain / cold chain (firms, service providers and infrastructure provision)
- Regulation of sector (regulatory authorities)

Pharmaceutical sector business capability gaps – need new or much stronger capabilities in the following areas

- Implementation of Good Manufacturing Practice (GMP) – an approach to pharmaceutical operations required for market access
- Regulatory affairs and compliance
- Process development and production of Active Pharmaceutical Ingredients (APIs)
- Process development and production of biologics
- Export marketing, product management, channel management
- Clinical trials (service providers)
- Regulation of sector (regulatory authorities)

2.3 CHECKLIST FOR STAGE 2: BUSINESS CAPABILITY IMPLICATIONS

When Stage 2 is complete, STED analysts …

		Importance
… should have done the following:	Analysed what future business capabilities are required to achieve the vision for the future set out in Stage 1.	Required
	Identified the main gaps between the sector's current business capabilities and those required to achieve the vision.	Required
… should have produced the following outputs:	A list of the main business capability gaps.	Required
	A description of each of the main business capability gaps. The description should cover what the business capability is, why it is important in the future envisioned and what the nature of the gap is. It should make reference to issues that are specific to the sector and country being researched.	Required (for report)
… should have used the following information sources:	Information collected under Stage 1.	Required
	Insights and opinions from industry sources, including people involved in steering the project, interviewees, workshop participants and ILO constituents.	Required
	Insights from existing research literature on the sector.	If available
	Logical synthesis of information. Skills researchers can often improve on a list of issues gleaned from industry sources and the literature by working through the logical implications of the chosen vision and the business capability requirements identified.	Required

STAGE 3: WHAT KINDS OF SKILLS?

3.1 TWO KEY QUESTIONS

The analysis in Stages 1 and 2 focuses on the characteristics of the sector, the business environment, envisioning the future, and business capabilities. Its focus is at the level of the sector and its firms. Aside from a brief look at data on occupations, it does not drill down to the level of skills.

Stage 3 brings the analysis to the skills level. It addresses two key questions, one that is primarily forward looking and one that focuses particularly on the present.

- What kinds of skills are required to bridge the business capability gaps identified in Stage 2?
- What existing skills gaps are there that would have to be tackled even if no attempt was made to tackle the business capability gaps?

3.2 FRAMEWORKS FOR ADDRESSING THE QUESTIONS

It is necessary to address both key questions systematically, simultaneously taking account of:

- All parts and all functions of a typical firm;
- Every level of skill; and
- Each significant occupation.

It is also necessary to take account of other factors that vary between sectors, and even between firms within a sector that impact on skills requirements, including technologies and forms of work organization.

One of the major pitfalls in practical skills research is to rely on the preconceptions of the researchers, or indeed of stakeholders consulted, as to where the skills issues are. Addressing the questions systematically often highlights issues that would otherwise be missed, or provides a better perspective on issues that are partially understood. Even if it produces no new insights, it allows for greater confidence that already-known issues are valid and comprehensive.

The following frameworks provide a structure for considering these issues systematically.

3.2.1 Covering all parts and functions of a firm

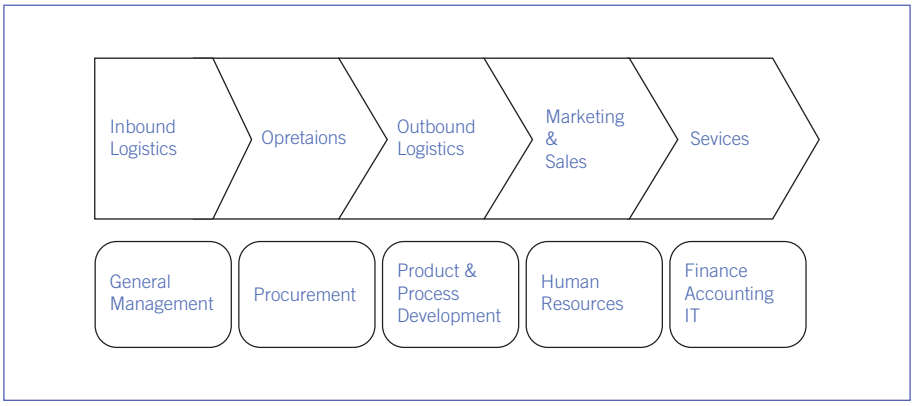
Figure 3.1 provides a framework for thinking systematically about the different parts and functions of a typical business. Its main purpose is to facilitate thinking about skills requirements outside the operations part of a firm. When firms are internationalising, or are endeavouring to compete more effectively in their domestic market, sales and marketing, product and process development, sourcing inputs (part of procurement), customer service and logistics are often areas where improvement is centrally important to success. These are all areas where skills typically play a major role in improvement.

Management skills are also frequently an issue, whether because there is a recognised need to upgrade and broaden the skills base of the management team, or because senior managers over-rate their own management competence. It is particularly important that STED analysts should reflect back a realistic view on management skills if firms consulted appear to be complacent about the quality of their management.

In addition to using this framework in analysing areas outside operations, it is important to drill down into the different parts of the operations area within a firm. As activities within operations vary considerably between sectors, it is not possible to provide a universal framework, but the following are some of the main areas that may be present in a manufacturing operation.

- Manual assembly
- Operating hand-operated machinery
- Operating or minding machinery that is partially or fully automated

Figure 3.1: Main functions of a typical firm



- Operating or minding process equipment
- Setting up machinery or process equipment
- Machinery or process equipment maintenance
- Quality control, testing and quality assurance
- Documentation (including regulatory compliance)
- Materials handling
- Stores operation
- Improvement of the production process
- Management of the production process
- On-the-job training
- Cleaning, security, food preparation, building repairs and other support activities

Operations in services firms may have some of the same areas as in manufacturing, but also include diverse other areas such as, for example:

- Telephone-based services
- Computer-based administrative work, such as back-office services
- Computer-based professional work such as IT development or technical drawing
- Front of house, catering, housekeeping and other hospitality-related activities.

3.2.2 Considering all levels of skill and all significant occupations

While considering skills needs across all of a typical firm's parts and functions, it is important to consider all levels of skill, and to take account of occupations that are significant now, or will be required to underpin bridging the capability gaps identified.

STED is intended to address all skill levels, and all feasible sources of skills. It is important that researchers should not get distracted from this by institutional interest in specific areas or levels of skill, or in specific types of skills formation. In most cases, tackling emerging and existing skills gaps will require action across a range of skill levels, using a range of different approaches to ensuring an adequate supply of skills.

A practical way to cover all levels of skill systematically is to use ISCO 1-digit classifications as a checklist for each area within the business. These classifications can be annotated with important occupations for the present and future identfied through research into the sector. Table 3.1 provides an example.

Table 3.1: Checklist for looking at skills across all levels, with an example based on an agro-food processing sector

ISCO 1-digit Classifications	**Key or Problem Current Occupations**	**Key Emerging Occupations**	**Conclusions** (on Skills to Bridge Business Capability Gap or on Existing Skills Gaps)
Managers etc.		International commercial managers	Critical need for international commercial management and marketing skills
Professionals	Mechanical engineers	Food scientists Logistics managers	Mechanical engineers with skills in food automation. Food scientists for process improvement, product development, management of testing and production management. Logistics managers at range of levels to design, implement and manage both in-country supply chains and customer logistics.
Technicians & Ass. Professionals	Food technicians	Automation technicians	Technicians for food testing, production operations and automation.
Office Clerks		Foreign language customer service	Mainly English language, plus some Arabic, with cultural training.
Service & Sales Workers	Domestic market sales and marketing	International marketers	Formally trained sales and marketing staff. International marketers with foreign language and cultural skills to work with commercial managers.
Craft & Related Trades		Cross-skilled mechanical and electrical trades	Need combinations of skills for set up and maintenance of machines that combine mechanical, electrical and computer technologies, which breaks down the boundaries between existing trades.
Operators and assemblers		Operatives with low level technician skills	More knowledgeable and highly skilled operatives needed to operate machines and production processes optimally.
Elementary occupations		Cleaners knowledgeable about good cleaning and hygiene practice	Compliance with food safety regulations requires stronger skills and knowledge among cleaners

3.2.3 Impact of technologies on skills requirements

It is important for a skills analysis to take account of current and future technologies in a sector, as they have a major impact on skills requirements. Changes in technology will change skills requirements.

In some cases, the technology in use in a firm affects the detailed skill requirements associated with a role, without impacting on the type of occupation required. For example:

- The skills required by food processing operatives vary significantly depending on whether they are working in manual food assembly, automated food assembly, continuous process-based food production, batch process-based production, on any of a range of types of packaging operation.
- Mechanical engineering technicians or mechanical fitters will need different skills depending on whether they are involved in installation, maintenance, machine set-up, modifying machines, tool-making, product development, or are themselves responsible for producing mechanical products. The specific technical skills they require will depend on the machinery and equipment, on the materials being used, and indeed on where the work is being done. They may or may not require electronics and computer-related skills in addition to mechanical skills – most machinery now has electronic components and some form of computerised controls.
- The detailed technical skills required by a software engineer vary depending on the computer language, software development tools and development environment, and may vary depending on the equipment on which their software is intended to operate and on the technical purpose of the software.

In other cases, the technology in use in a firm has a significant impact on types of occupation required. For example:

- A pharmaceutical operation specialising in chemically synthesised pharmaceuticals requires mainly chemists, chemical engineers, chemistry technicians and operatives with knowledge of chemistry. A pharmaceutical operation specialising in biologically synthesised pharmaceuticals requires mainly biological scientists, biological technicians, bioprocessing technicians and bioprocessing operatives.
- As manufacturing operations become more automated, the level of skill based on technological knowledge that is required typically increases. There is less need for low skilled work and work that involves mainly manual skill. There is more need for work that involves understanding the manufacturing process, optimising it, minimising downtime and keeping it running as designed. This tends to shift the balance of numbers away from operative level workers and towards technicians, engineers, scientists and specialists in areas such as quality assurance and documentation. It also tends to change the skills required within an occupational area, requiring more technological knowledge and the ability to apply it. In some cases, this can go so far as to move many of the workers concerned to a higher level occupation, with operatives and craft workers becoming technicians, and with technicians being upskilled to engineer level.

- Increasing penetration of information technologies into workplaces has added computer skills to the skills requirements of many jobs. This trend is continuing.

3.2.4 Impact of work organization on skills requirements

Work organization has a major impact on skills requirements, particularly in terms of core, or generic, skills and in terms of multi-skilling and cross-skilling[12]. Two long established approaches to work organization that have historically been common are systems based on high levels of skill at craft and technician level, with strong demarcations between occupations; and systems based on semi-skilled and skilled workers with narrow training, working under the close direction of managers.

The tendency in most developed countries, arguably starting with the popularisation of Japanese management techniques in the 1980s, has been to move away from these models in ways that favour:

- Team-based forms of organization;
- Cross-skilling and multiskilling to allow people to move from one type of work to another, to improve cooperation between people from different occupations, and to allow a single person to do a job that requires more than one skillset where this is efficient;
- Moving responsibility for aspects of quality management, coordination of work, improving efficiency and preventing and solving problems as close to the front line of work as possible.

Implementing these changes requires strong core skills among front line workers, and is facilitated by multi-skilling and cross-skilling.

The evidence from the four STED pilots is that that there is commonly scope for developing country sectors exposed to trade to gain competitiveness through these newer forms of work organization, and that indeed many are already moving in this direction. Developing core skills across the workforce, and using multi-skilling and cross-skilling approaches where appropriate, is provides a necessary underpinning for this strategy.

Box 3.1: Core skills

Core skills include:

"… literacy, numeracy, communication skills, teamwork and problem-solving and other relevant skills – and learning ability – as well as awareness of workers' rights and an understanding of entrepreneurship as the building blocks for lifelong learning and capability to adapt to change".

Conclusions on skills for improved productivity, employment growth and development, International Labour Conference, 2008.

[12] Where a person skilled in one established role also develops skills in another, but not necessarily to the same depth as a person working solely in the other occupation.

3.3 LINKING BUSINESS CAPABILITY GAPS TO SKILLS NEEDS

The section above presented frameworks to assist STED analysts in thinking about the skills needs questions that Stage 3 poses in a detailed and systematic way. The first of these questions is:

What kinds of skills are required to bridge the business capability gaps identified in Stage 2?

The framework presented in Table 3.2 is a useful aid to summarising the more detailed analysis, and to gathering stakeholder views. With the business capability gaps listed

Table 3.2: Framework linking business capability gaps to types of skills required with a food-processing example

Business capability gaps	**Types of skills required**
Product Development	Graduates with skills relevant to food product development
	Educating existing managers, marketers etc. in food product development
Operational effectiveness and food safety	Extend skills on All levels of manufacturing operations: • Operatives & technicians • Production managers • Food scientists • Engineers
	Availability of qualified trainers
Regulatory Compliance	Awareness of importance of strict compliance across all levels of manufacturing operations
	Skilled Quality Assurance Managers
Logistics / Supply Chain / Cold Chain Management	Logistics and supply chain specialists
Export marketing: Product management, channel management	• Marketing managers and staff • Sales staff • High level international business development staff
Supplier Capability	Skills of farmers (and other producers)

in the first column, and the second column initially blank, it has been used interactively in stakeholder workshops to gather views on the skills needs associated with each capability gap. This was done, for example, at the first stakeholder workshop in the Bangladesh STED pilot. After the main skills required to bridge each business capability gap have been identified, the framework has also been used to summarise these findings for review at a stakeholder workshop. The detailed content on agro-food processing shown in Table 3.2 was presented for comment at the second stakeholder workshop in Bangladesh. The framework can be extended by adding further columns to summarise skills supply gaps (Stage 5) and possible responses (Stage 6).

3.4 SKILLS REQUIRED TO BRIDGE EXISTING SKILLS GAPS

The second question posed by Stage 3 is:

What existing skills gaps are there that would have to be tackled even if no attempt was made to tackle the business capability gaps?

The frameworks presented above can be used to guide industry interviews, industry surveys, stakeholder workshops and similar techniques to gather industry perceptions of existing skills gaps. They can also be used by STED analysts to assist in thinking about this question in a systematic way, drawing on industry perceptions, the literature and their own knowledge of the sector.

STED is designed to provide a high level analysis. In looking at existing skills gaps, it is intended identify the main gaps, as the basis for setting out broad prescriptions to tackle the main existing skills gaps affecting the sector. It will not provide a high level of detail.

In cases where a greater level of detail is required, and if sufficient resources are available, it is possible to supplement the core STED methodology by adding detailed firm level research at a sample of firms. This can be done using one of the Skills Needs Analysis or Training Needs Analysis tools that are available. STED does not prescribe a specific tool.

3.5 CHECKLIST FOR STAGE 3: WHAT KINDS OF SKILLS?

When Stage 3 is complete, STED analysts …

		Importance
… should have done the following:	Linked business capability gaps through to skills needs, taking account of: (i) all parts and all functions of a typical firm in the sector; (ii) every level of skill and significant occupation; (iii) the impact of technologies on skills requirements; and (iv) the impact of work organization on skills requirements.	Required
	Identified skills needed to bridge existing skills gaps, again taking account of: (i) all parts and all functions of a typical firm in the sector; (ii) every level of skill and significant occupation; (iii) the impact of technologies on skills requirements; and (iv) the impact of work organization on skills requirements.	Required
… should have produced the following outputs:	Table cross-referencing business capability gaps identified in Stage 2 to types of skills required to address them.	Required
	List of existing skills gaps that must be addressed	Required
… should have used the following information sources:	Findings from Stages 1 and 2	Required
	Qualitative information from interviews, survey questionnaires, literature, stakeholder consultations and pre-existing knowledge on (i) links between all parts and all functions of a typical firm in the sector; (ii) every level of skill and significant occupation; (iii) the impact of technologies on skills requirements; and (iv) the impact of work organization on skills requirements.	Required
	Stage 3 findings of earlier STED studies from other countries on similar sectors.	Useful source of ideas

STAGE 4: HOW MANY WORKERS BY SKILL TYPE?

4.1 SKILL SETS, WORKERS AND OCCUPATIONS

Companies hire workers, not skill-sets. In order to develop useful policy recommendations, anticipated developments in skills requirements have to be translated into demand for workers.

This is done in a way that takes account of:

- the conclusions on skills requirements from STAGE 3;
- the current occupational employment structure of the sector; and
- expected changes in requirements for existing skills types.

It is preferable if demand for workers can be addressed through a simple quantitative model. How this can be achieved practicably is the main focus of this chapter. However, as noted in the discussion of quantitative profiling of sectors under Stage 1, there are frequently significant gaps in the data available. Taken together, the gaps can be so extensive as to make the basis for a model too uncertain for a quantitative exercise to be worthwhile.

In these cases, the best that can be done is to look at the quantitative issues in a qualitative way. This approach can produce meaningful results. Qualitative labour market information can provide a reliable indication of the current balance between supply and demand for an occupation or a qualification, even if quantitative information is available neither on supply nor on demand.

Qualitative analysis is necessary, in any case, to provide a reality check on quantitative modelling of supply and demand. There are significant pitfalls to be avoided in lack of comparability between estimates of supply and demand, calculation of the demand associated with replacing people leaving employment in an occupation in the sector, shifts in the occupational composition of employment and prospective changes in labour productivity. It is frequently necessary to use qualitative analysis to inform decisions about how to tweak quantitative models of demand and supply in order to obtain plausible results.

The description of stage 4 in this section focuses on describing a quantitative approach towards assessing future demand for workers with particular skill sets. The

simple STED model structure presented in this section can easily be implemented in a spreadsheet. Section 4.2 sets out the framework for the model. Section 4.3 sets out a worked example.

4.2 FRAMEWORK FOR THE MODEL

Figure 4.1 provides an outline of the full version of the labour demand model. It is used to translate the scenarios developed in Stage 1 into projections of labour demand, disaggregated by occupation. The approach shown here was not used in any of the STED pilots, but has been used by one of the authors in a number of other skills sectoral studies on internationally traded sectors.[13]

4.2.1 Sales

The model starts with projections of exports and domestic market sales for the sector. These projections come from interpreting the scenario being modelled into quantitative terms, taking historical data from the sort of statistical sources described under Stage 1 as the starting point. A straightforward approach is to either apply a percentage change or a constant change each year over a 5 year time horizon.

National level statistics on trade, output and existing projections may be available in the national currency, a major international currency (typically the USD) or both. Internationally comparable statistics on international markets and trade are most often available in USD. As a consequence, there is a need to decide on the currency in which the model is denominated. Either the national currency or the international currency can be used when modelling the sector, so long as the usage is consistent.

Sales data will be sourced in terms of nominal prices, but it is necessary to deflate the data to remove the effects of inflation. A consumer price index is a good choice as the model is concerned with developments in the real value created by labour (reflected by a consumer price index), not with the number of units produced (reflected by a product price index). Deflation of the value of future sales should be based on published projections where available, and on a reasonable rate consistent with the scenario for later years.

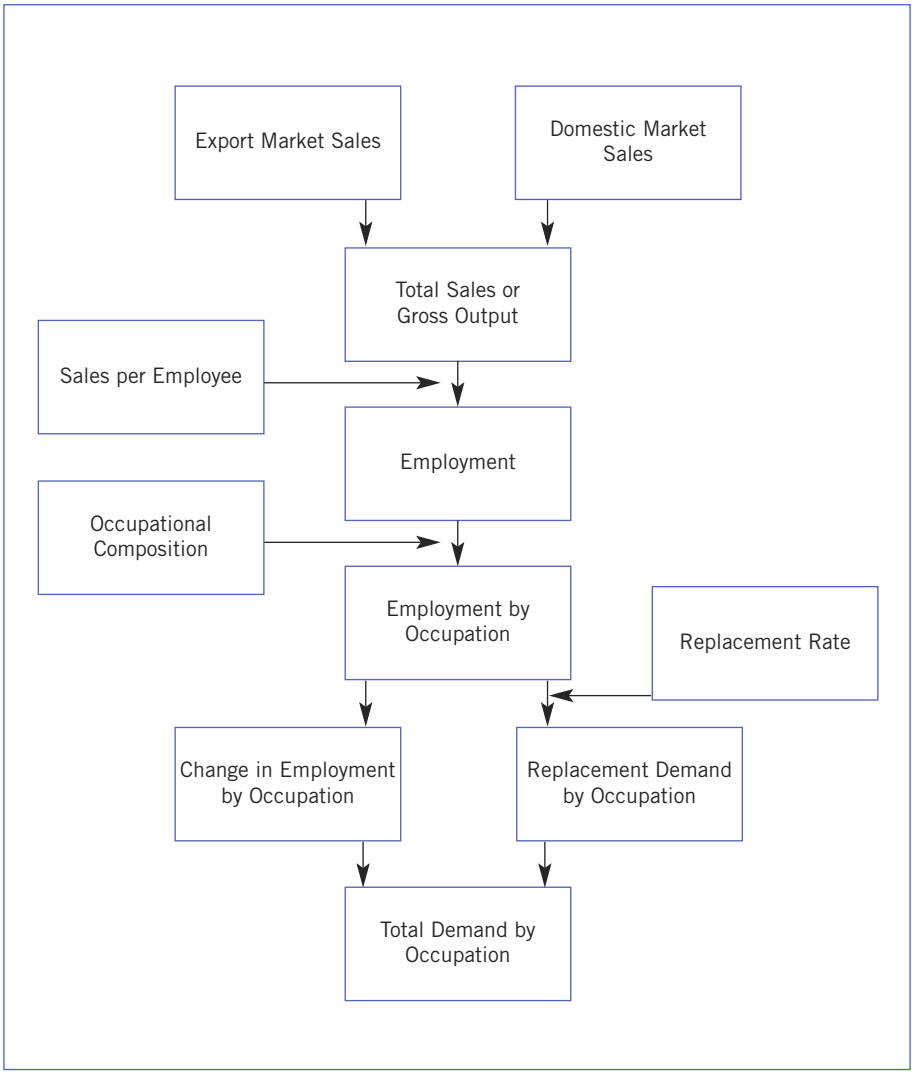
If it is considered likely that the export-oriented part of the sector will behave differently to the domestically oriented part of the sector in terms of factors such as output per employee, then it may be appropriate to model them separately, and add the results.

[13] See, for instance, EGFSN (2005).

4.2.2 Sales per employee

It is necessary to take a view as to how sales per employee will develop. The first step should be to review how the relationship between sales and employment has developed over the previous few years. The quantitative information should be combined with qualitative information from the research to produce a working estimate of the rate of change in sales per employee. An example of qualitative information that might suggest a higher-than-historical rate of increase would be if the sector

Figure 4.1: Framework for the demand model



was replacing existing equipment with equipment that requires much lower numbers of operators per unit of output. An example of qualitative information that might suggest the opposite effect would be a planned major increase in supporting staff in areas such as perhaps customer support or in additional work required to comply with regulations.

4.2.3 Projecting employment

Employment projections for the sector should take the most recent reliable employment number for the sector as their starting point. The headline number for the sector from the most recent labour force survey is usually a good choice, as it will be comparable with other labour force survey data used in the model. Using a headline figure also helps avoid the need for a technical discussion about treatment of part time, contract and seasonal employees in the written report.

The sales and productivity growth projections are applied to the starting employment number to produce employment projections for the sector.

4.2.4 Projecting employment by occupation

Data on the occupational composition of the sector should ideally be obtained from analysis of labour force survey data. If there is no reasonably recent labour force survey, if there are serious doubts about how accurately occupations and sector have been coded, or if the size of the sample seems inadequate, alternative approaches include obtaining data through an enterprise survey or using data on the occupational composition of the same sector from another country where the profile is thought to be similar.

Labour force survey occupational data may be available at varying levels of detail from International Standard Classification of Occupations (ISCO) 1-digit (10 categories) to 4-digit (436 categories).

The quality of the data on the occupational composition of the sector should be considered before deciding on the level of detail to be used in the model.

- Sampling error is an important consideration in deciding the level of detail that can be used from a labour force survey. A large number of data points for the sector may allow occupations to be disaggregated to 3-digit or even 4-digit level. Often, however, smaller sample sizes limit the level of detail that can be used with confidence to 1-digit level. A compromise approach that can work well is to analyse the occupational data at 1 digit level, but to also pick out data on the sector's principal occupations at a more detailed level.

- The quality of data coding may also be an issue. It is not exceptional that labour force survey data on more detailed occupations in a sector is inconsistent with information on the mix of jobs in the sector known to anyone familiar with firms in the sector. A key occupation may apparently be missing; an occupation

not normally associated with the sector may appear to account for a substantial share of employment. While this is inconvenient for skills researchers, it may come about because the statistical office responsible has prioritised getting coding right to one or two digit level, with plans only to publish results at that level of detail.

The simplest approach to including the occupational composition of employment in a sector is to use the most current survey data. Sometimes, however, there is good evidence that the occupational composition is likely to change over the period being considered. For instance, there may be a consistent existing trend in occupational composition visible in time series occupational data. Alternatively, it may be the case that the vision for the sector's future development involves a shift in the mix of activities within the sector, perhaps with more R&D or marketing, perhaps with production activities becoming less labour intensive. In cases such as these, it may be appropriate to estimate a different occupational composition for the end of the period projected, and to interpolate intermediate compositions for the intervening period.

Projected employment by occupation is calculated simply by distributing each year's employment projection according to the projected occupational composition for that year.

4.2.5 Demand by occupation

Demand for labour in each occupation has two components.

- An increase in the numbers employed in an occupation over each year of the projection, calculated as employment in the occupation in year y, minus employment in year y-1.
- The requirement for people to be replaced because they leave the workforce, or move to a different sector or occupation. This is usually estimated by applying a replacement rate to the number employed in the occupation in the previous year.

The first of these components is calculated by simple subtraction. The second is more complex and uncertain because it is often difficult to obtain reliable data. It should ideally be addressed by studying the age profile of those employed in the occupation, which can, in principle, be obtained from labour force survey data, and by studying how the age profile has evolved over time. It is possible, in principle, to identify patterns of exit from the occupation by age, and to apply these to the current age profile of the occupation to estimate the rate at which those employed in the occupation in the sector under study will have to be replaced. STED analysts should start their work in this area by investigating whether suitable data is available from labour force surveys, whether there are enough responses covering the occupation and sector to produce a reliable current age profile, and whether there is enough historical data to profile the ages at which workers leave employment in the occupation and sector.

Patterns of departure from an occupation can be very different between sectors and between countries.

- In some cases, retirement will make a major contribution, as workers either reach normal retirement age or become unable to meet employer expectations. Retirement at normal retirement age is more common in developed countries, both because they are likely to have institutions in place to provide retirees with a decent standard of living, and because in many sectors the age profile of the workforce will be higher than in the corresponding sector in a developed country. Retirement due to incapacity is a feature of both developing and developed countries – even in developed countries workers in physically demanding or stressful occupations often find they cannot continue to the normal retirement age, and have to either retire early or change to a less demanding occupation.

- In some cases, there are well established patterns under which workers leave the workforce or change occupations as they get older. In some garment sectors, for example, women tend to leave jobs as sewing machinists once they start a family. It is observed in many areas that computer programmers tend to move into other areas as they get older, partly through moving into management and other business related roles, but also because some employers appear to prefer younger workers for these roles.

- In some cases, significant numbers of workers may move to another sector where they perceive better employment opportunities, or may even emigrate. Significant numbers of Irish garment sector workers were, for instance, recruited for electronics assembly by FDI companies in the 1990s. In one of the STED pilot countries, Kyrgyzstan, substantial numbers of garment workers were found to be emigrating to work in the Kazakh garment sector.

Complicating the matter, there is often good reason to think that the replacement rate will vary over time, depending on the opportunities the sector offers and the opportunities available in other sectors. The replacement rate is likely to vary between occupations.

If available labour force survey data is unsuitable or insufficient, as it frequently will be, it is necessary to take an alternative approach, or to supplement labour force survey data with other information. Additional information can come from enterprise surveys, interviews, workshops or other qualitative research activities.

Data on labour turnover at individual firms only provides a partial answer, as many of those leaving will go to a similar job at another firm in the sector, and hence will not be lost.

Total demand by occupation is calculated as the sum of the two components.

4.3 SAMPLE MODEL

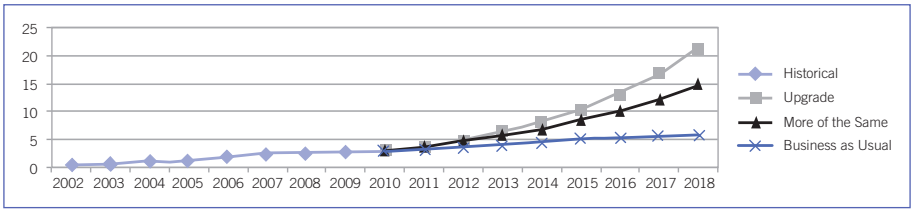
This sample model considers a sector which is well established in its domestic market, and which has increased exports strongly from a low base for several years. While much of the data used is real (from Bangladesh's pharmaceutical sector), some elements have been devised only for illustrative purposes, so the model as a whole should be treated as fictional.

For simplicity in presentation, the sample model assumes that employment associated with sales to the domestic market will be constant, so the model can focus mainly on the export part of the sector. The same approach can be applied to sales to the domestic sector. Both export and domestic sales can be handled together if sales per employee are similar for the two areas, but this will most often not be the case.

The sector that inspired the model is a technology sector in which export sales per employee are high, but the approach is equally applicable to a sector with much lower sales per employee.

The model uses trade data to establish historical sales denominated in nominal USD. It sets out three scenarios for export growth, each calculated as a percentage increase on the previous year's sales.

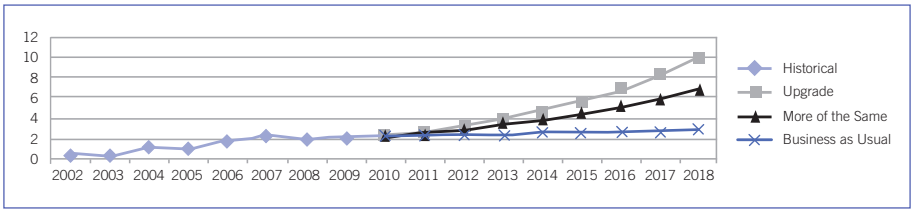
Figure 4.2 Export Growth Scenarios USD (bln.) – Fictional sector
Nominal prices



Source: authors' simulations

The export sales values in the model are deflated by a suitable consumer price index. Actual consumer price index data are used to deflate historical export data. Estimates are used to deflate projections of the value of exports.

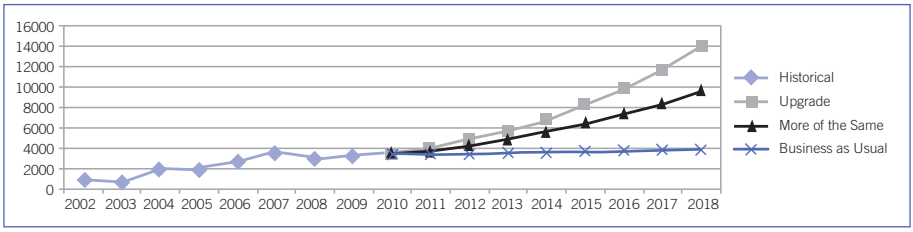
Figure 4.3 Export Growth Scenarios USD (bln.) – Fictional sector
Constant 2005 prices



Source: authors' simulations

Employment associated with exports is estimated for 2011. The employment implications of the three scenarios are calculated as a multiplier on export sales, deflated by an estimate of the rate of improvement in real labour productivity. In this case, an annual rate of increase of 1% has been assumed, with more rapid improvements production operations being offset by increased employment in export marketing and regulatory compliance.

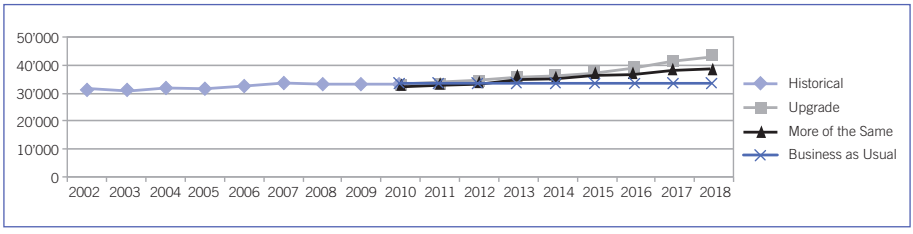
Figure 4.4: Employment associated with exports – Fictional sector



Source: authors' simulations

Employment associated with exports is added to employment associated with the domestic market. For simplicity in this illustrative example, employment associated with domestic market sales has been held constant at 30,000.

Figure 4.5: Total employment (associated with domestic sales and exports) – Fictional sector



Source: authors' simulations

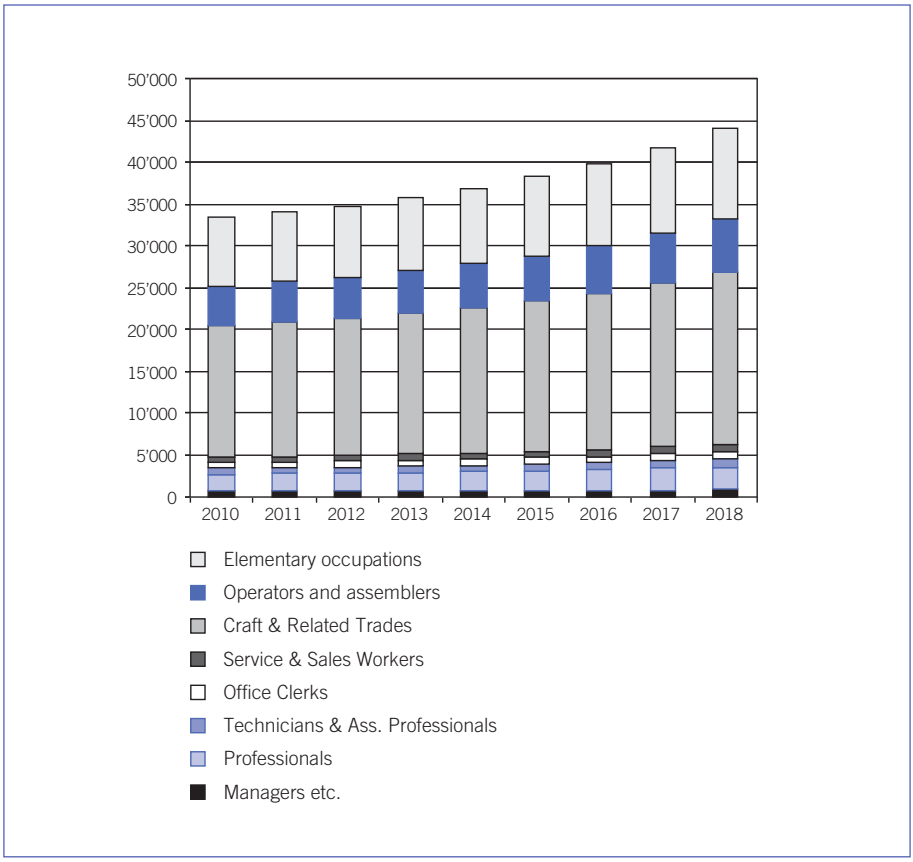
Employment under each scenario can be disaggregated between occupations. This illustration uses ISCO 1-digit occupational classifications, and focuses on just one of the three scenarios. While there are ten 1-digit occupations, two of these (armed forces and public officials) are not present in the sector. In a real world application, we would project changes in the sector's occupational composition over time, based on the replacement of operative work with quality assurance and mar-

keting work described earlier, and on any existing trends in the sector's occupational composition visible in labour force survey data. However, in this example we have assumed for simplicity that the overall occupational composition of the sector does not change at the 1-digit level.

With suitable source data, it is possible to do more, systematically using more detailed ISCO (or national equivalent) classifications, or segregating out major occupations within a 1-digit classification.

Demand for new people in each occupation is made up of two components – demand from growth in employment and from the need to replace people. In this example, the replacement rate is specified as a uniform 3% of employment in the previous year. Demand arising from growth is calculated as the change in employment from year to year.

Figure 4.6 Employment by occupation under "upgrade" scenario



Source: authors' simulations

Table 4.1: Skills demand by 1 digit ISCO code

	Managers etc.	Professionals	Technicians & Ass. Professionals	Office Clerks	Service & Sales Workers	Craft & Related Trades	Managers etc. Operators and assemblers	Elementary occupations
Growth-related demand								
2011	13	40	13	13	13	309	94	161
2012	16	48	16	16	16	369	112	192
2013	19	57	19	19	19	441	134	230
2014	23	69	23	23	23	527	160	275
2015	27	82	27	27	27	629	192	328
2016	33	98	33	33	33	752	229	392
2017	39	117	39	39	39	899	273	469
2018	47	140	47	47	47	1,074	327	560
Replacement demand								
2011	20	61	20	20	20	470	143	245
2012	21	63	21	21	21	479	146	250
2013	21	64	21	21	21	490	149	256
2014	22	66	22	22	22	504	153	263
2015	23	68	23	23	23	519	158	271
2016	23	70	23	23	23	538	164	281
2017	24	73	24	24	24	561	171	293
2018	26	77	26	26	26	588	179	307
Total demand								
2011	33	101	33	33	33	779	237	406
2012	37	111	37	37	37	848	258	442
2013	40	121	40	40	40	931	283	486
2014	45	135	45	45	45	1031	313	538
2015	50	150	50	50	50	1148	350	599
2016	56	168	56	56	56	1290	393	673
2017	63	190	63	63	63	1460	444	762
2018	73	217	73	73	73	1662	506	867

4.4 EXTENSIONS TO THE MODEL

The employment projections in this model are for direct employment. In some cases, there will be a policy interest in also projecting indirect and perhaps induced employment effects. Indirect employment refers to employment that arises in businesses that supply firms in the sector. Induced employment refers to the employment effects of spending by those employed in the sector and by those employed indirectly.

STED is not designed to address these issues itself, but projections for the sector from the model can be substituted into a macro-economic model structured around sectors if one is available, to produce projections for indirect employment effects and (given some care) induced employment effects.

Social Accounting Matrix (SAM) and Dynamic Social Accounting Matrix (DySAM) models, which are frequently used in providing technical support at country level by the ILO, are well suited to this. Input-output and sectorally-structured Computable General Equilibrium (CGE) models are also suitable.

Care is required with induced employment effects, because these effects are influenced by supply constraints on labour that are not always addressed by macro-economic models. If there is plenty of suitable labour available, induced employment effects can be substantial, and estimates from a model that does not take account of supply constraints may be valid. If there is a severe supply constraint on the supply of labour, with little scope to increase the supply through higher participation or inward migration, the net induced employment impact is likely to be very limited. Intermediate conditions, where labour supply is partially elastic, require an approach that models the supply constraint.

4.5 CHECKLIST FOR STAGE 4: HOW MANY WORKERS BY SKILL TYPE?

When Stage 4 is complete, STED analysts …

		Importance
… should have done the following:	Obtained qualitative information on labour market conditions for the sector	Required
	Reviewed available sectoral data on output, export/domestic sales, labour productivity, employment, occupational composition of employment, and data relevant to estimating replacement rates	Required
	Undertaking modelling work on employment and demand for labour	If suitable data available
… should have produced the following outputs:	Qualitative assessment of current and future supply and demand for skills in the sector.	Required
	Model of employment and demand for labour in the sector disaggregated by occupation, with projections based on one or more scenarios from Stage 1.	Should be an output if suitable data available
	Model projecting indirect and induced employment	Optional
… should have used the following information sources:	Qualitative information from interviews, survey questionnaires, existing literature and stakeholder consultations	Required
	Trade data from national or international sources (see Stage 1)	Required
	Output and sales data from existing enterprise surveys and from published market research	Enterprise survey data required if available. Judgement required on market research data.
	Labour force survey – summary data and microdata	Required if available at suitable level of detail
	Broad scan for data relevant to estimating replacement rates	Required if demand is to be modelled

STAGE 5: SKILLS SUPPLY GAP

5.1 TYPES OF SKILLS SUPPLY GAP

Stage 5 compares the findings on skills demand from Stages 3 and 4 with an assessment of the supply of skills available from the current training and education system, and from other sources including migration, training for the existing workforce and measures to bring people into the workforce. The purpose is to identify gaps between the skills available from these sources and those needed now and in the future.

There are three main types of gap, which may exist separately or in combination:

1. A quantitative gap, under which the number of workers available with broadly suitable skills is insufficient;
2. A qualitative gap under which the number of people available may be sufficient, but their skills are deficient relative to what will be needed; or
3. Barriers to making full use of the available supply of people mean that demand for skills will not be adequately satisfied.

5.2 QUANTITATIVE SKILLS SUPPLY GAPS

5.2.1 Labour market evidence

The first step in quantitative analysis of skills gaps is to consider what labour market evidence implies about how the balance between supply and demand has developed in recent years, and how it stands now.

In skills analysis and in anticipation of the balance between supply and demand for an occupation or a type of skill, it is often difficult to make supply data comparable with demand estimates. Observation of actual labour market conditions provides indispensable insights into what the actual supply-demand balance is, and how it has developed.

If there are elevated vacancy levels, if pay is increasing faster than for other types of occupation in the economy, and if labour turnover is high with many workers moving between employers in the sector, then demand probably exceeds supply. If vacancy levels are low, if suitably qualified people are unemployed or

taking up work outside their area of expertise, if pay is depressed, and if voluntary labour turnover is low, then supply probably exceeds demand.

However, if some indicators point towards an excess of supply over demand and others point in the opposite direction, then matters may be more complex. If employers complain about difficulty in finding sufficient numbers of workers, but other evidence suggests that there are plenty of people but they do not want to work in the sector, the problem may be with the sector having a poor image, with poor working conditions, or with levels of pay that are not competitive with other sectors of the same economy, rather than with a straightforward shortage of supply. The solution may be to improve working conditions, to improve productivity so as to allow improvements in pay or to develop new sources of workers, rather than endeavouring to increase the supply from existing sources.

5.2.2 Sources of labour

Before looking in detail at whatever data on the sources of key skills come most easily to hand, it is important to check what sources of labour the sector actually uses for its main occupations.

The answer for an occupation may be straightforward – that the sector recruits only graduates[14] of a number of specific courses or other programmes of training, and will take almost anyone from these courses. This is most common where an occupation is regulated, and only people with a specific qualification, linked to a specific set of courses or other programmes of training, are permitted to do the work. It may also come about through collaboration between a sector's employers and providers of training that produces courses very closely tailored to the sector's needs.

More broadly, the sector may recruit graduates with a particular type of qualification from any provider of education and training in the country. In many cases, employers doing this differentiate between graduates on the basis of the course provider or the grades obtained. Some providers or grades will be less demanding than others, but even after accounting for this not all graduates of these courses may be judged by firms in the sector to be sufficiently well skilled to form an effective part of the supply. However, there are other possibilities. For specific types of job, employers may:

- *Recruit people whose qualifications are not linked to the type of job, and train them to be productive.* This can be at any level, from recruiting people with no qualifications or low level qualifications, to recruiting graduates with bachelor and higher de-

[14] The terms *graduate* is used here in the sense of a person who has qualified from any substantial programme of education or training, including both TVET and university level courses, and including apprenticeships and other formal programmes of learning that take place partially or wholly in the workplace.

grees. In these cases, the issue of whether the supply of people is adequate is partly about whether there are economy wide shortages of labour at the appropriate level of qualification, and partly about the capacity and willingness of employers to train enough.

- *Recruit people whose qualifications are broadly relevant, and give them specific training and experience.* An example would be recruiting people from any type of engineering technician or engineering craft background, and training them to work as technicians on a specific technology or set of technologies. Another example would be recruiting people with bachelor degrees or higher in any numerate discipline to work in some area of information technology that requires numeracy but does not require the full depth of a degree in computing.
- *Provide training for existing employees, or support them through externally provided training.* Promoting internally is common practice internationally, but some countries, sectors and firms take it further than others. Some rely almost solely on initial education and training to provide a stream of people with the skills associated with craft, technician or bachelor degree level technical qualifications. Others, to varying extents, have lifelong learning strategies that support their existing staff in upskilling. Some systematically use upskilling as a major source of skills. Some systematically provide reskilling opportunities to help existing staff move from occupations where employment is falling to higher demand occupations.
- *Recruit people with the skills required from another sector.* If another sector employs people with the skills required, the sector being studied may, in practice, recruit some or all of its people from the other sector, and depend on it to maintain an adequate supply. This will not always be a problem for the other sector – it may even be seen as a more attractive source of employment because of the greater opportunities for career progression available, the numbers involved may be small, and a moderate level of labour turnover can be beneficial in any case. As an example, some US retailers highlight how the skills they develop and the experience they provide can provide the starting point for a career in other sectors, when they are recruiting.
- *Recruit inward migrants with the required skills.* If demand exceeds the local supply of skills it may be satisfied through inward migration if language and cultural factors allow, and if immigration law permits. If the country has a substantial diaspora, this can provide a good source of people, and may be the best source of very highly skilled and experienced people for mid-level and senior level roles.
- *Recruit people from outside the existing workforce or from among the underemployed.* There may be people not currently formally employed who have the required skills. Groups that may be relevant include the unemployed, people working outside the formal economy, those working in the home, people assisting on a family farm or in a family business, people involved in marginal enterprises (including some street traders and subsistence farmers), people with disabilities,

and people who are retired. Government active labour market programmes may support their recruitment through providing training and other assistance towards entering the workforce. Underemployed groups may also be a practical source of skills – people who are involuntarily part-time, temporary workers or seasonal workers.

Estimates of the available supply of labour should be based on the sources that are actually used by the sector, and the sources that could feasibly be used in the judgement of employers and other stakeholders, not on whatever data happen to be most conveniently available.

It is important that STED analysts should not assume that a sector will necessarily make use of a supply of people qualified to work in an occupation to the satisfaction of the education and training system.

- STED pilots observed a number of cases where long-established qualifications no longer met their target sector's needs, using obsolete technologies and teaching irrelevant skills and working practices. This seemed to occur frequently with courses delivered as a part of the vocational stream of a country's school system.[15]
- It was apparent from stakeholder research in STED pilots that employers placed a low value on some apparently suitable qualifications, with some universities or training providers being strongly preferred over others.

5.2.3 Data and projections on supply

Quantifying supply from programmes of education and training

Where the key sources of new skills supply are programmes of education and training, data on the flow of graduates from these programmes provide important insights into skills supply.

Data may be available from a range of sources, including the following.

- The Ministry for Education, the Ministry for Labour or agencies of these ministries such as funding bodies, qualifications bodies or quality assurance bodies.
- Organizations of educational institutions.
- Professional organizations, which may assemble statistics on the programmes that will provide their stream of future members.
- Industry representative organizations, which may assemble statistics on the programmes that provide their members with key skills, and whose members may employ trainees such as apprentices and may get involved in other courses through providing work placements and guest lecturers. In some cases, employers collaborate with external education or training providers to provide courses

[15] In these cases, the qualifications may have persisted because of a lack of more attractive options for learners.

for employees that fit into the mainstream framework of education and training, and industry representative organizations may be a good source of data on this.

- Employee representative organizations, particularly those that specialise in specific areas of skill, which may assemble statistics on the programmes that will provide their stream of future members, and which may have trainees such as apprentices within their membership. In many cases, workers representative organizations are themselves significant providers of education and training, whether continuing education and training for their members or initial education and training for those entering employment in their area of specialization.
- Agencies responsible for promoting inward investment or enterprise development often collect statistics from courses in subjects that provide skills of interest to potential investors, and to indigenous enterprises with growth potential.
- If the country has a well-established skills anticipation system, one of the responsibilities of the system is typically to produce data on skills supply, including data on the flow of graduates from courses disaggregated by discipline and level of qualification.
- It is also possible to survey relevant providers of education and training to obtain data, although a survey of significant scale would most likely only be feasible within a STED initiative that is particularly well resourced, and with backing from a local partner capable of insisting that relevant education and training providers cooperate. To be reliable, surveys on student and graduate numbers generally require that the whole population be surveyed, with a response rate close to 100%.

Different types of data on students and graduates can be used to assess the skills supply gap:

- Graduate data – historical time series data on the number of graduates from relevant courses
- Student data – historical time series data on the number of students/trainees/apprentices in the system, ideally disaggregated by the stage of the programme (by year of course in the case of higher education).
- New entrant data – historical data on the number of students/trainees/apprentices taking up places. This is not necessarily the same as data on the number of first years – depending on the course and country, significant numbers of new students may leave before the reference date when students are counted, and some students may repeat the first year.
- First destination data – historical data on where students have gone after graduation, in terms of the split between employment versus further study versus unemployment versus other destinations, and in terms of information about the industries and occupations to which those in employment go.

In most cases, it will be sufficient for STED purposes to quote graduate data to demonstrate how many graduates are available. Where courses are of more than a year or two in duration, it can also be worthwhile to quote trends in student or new entrant numbers to demonstrate how the graduate pipeline is developing.

First destination data on what graduates do after graduating can be helpful in interpreting the actual availability of graduates to the sector under study in a number of respects:

1. It highlights how many graduates continue their studies rather than directly entering the labour market. While these graduates will mostly enter the labour market later, many will appear in graduate statistics again when they re-graduate, and it is important to take precautions against double counting.

2. It highlights where graduates that the sector may want actually go elsewhere in practice – whether to other sectors, to other countries or failing to enter the workforce through unemployment or being unavailable for work.

3. If reliable occupational data are available from the first destination survey, it highlights the extent to which graduates go into occupations closely linked to their qualification, or go into a more diverse range of occupations. Similar data can be used to explore what qualifications the sector requires in practice for specific occupations.

STED analysts should anticipate that in most cases only some of these types of data will be available, that they will not necessarily be available for all relevant parts of the country's education and training systems, and that systems of classification by subject and level of study (and qualification) will not necessarily suit the requirements of their research. They should be prepared for much of the student/trainee/apprentice and graduate data they would ideally like to use in their analysis and present in their report being unavailable from existing sources, and should plan to work with what they can get.

Supply from underutilized pools of labour

The earlier discussion of sources of labour highlighted a number of types of sources that fall broadly into an "underutilised pools of labour" category. In many cases, these pools are so obviously large relative to demand that there is no great need to quantify them. This might, for example, be the case in some countries when the relevant pool of people is "young unemployed", "family members of subsistence farmers" or "people engaged in home duties interested in entering the paid economy".

In other cases, there may be a need to be more specific. If it is practicable to quantify these numbers, it will typically either be through obtaining information from a public employment service (PES) or through analysing detailed data from a labour force survey.

Box 5.1: More sophisticated analysis of graduate supply

If time series on all of the types of student and graduate data described in the text are available at a detailed level, and using consistent systems of classification, then it is possible in principle to move beyond presenting historical data, and (for longer programmes of learning including, for example, apprenticeships and bachelor degrees) to project future graduate numbers based on current student/apprentice numbers and on current acceptances of places on courses.

Data availability in the STED pilots was not sufficient to support this. It is anticipated that it will be feasible only in a minority of STED initiatives, and that even where it is feasible it will only be justified where student/trainee/apprentice numbers are known to be changing significantly and it is necessary to estimate what the impact on graduate numbers will be.

Making these projections involves assumptions about attrition between succeeding stages (from acceptance to first year student numbers, to second year student numbers, …, to final year student numbers to graduate numbers) based on what has happened historically. It also involves taking account of factors such as part-time study, repeating years, student sabbaticals and optional add-ons to courses that may result in some students taking longer than usual to graduate, where the numbers concerned are significant.

STED analysts should note the possibility that rates of attrition might change, whether because of efforts by institutions to reduce attrition, because an increase in intake without a corresponding increase in resources may increase attrition, or because changes in the readiness or ability profile of students/trainees/apprentices could change the proportion capable of graduating. Labour market conditions can also have an impact on attrition by changing the strength of economic pressures on students/trainees to leave before graduation, whether because the immediate economic rewards of leaving early vary with labour market conditions or because having a family member spend time studying may be more affordable when demand for labour is strong, but less so when weak demand for labour damages incomes and employment security.

In most cases, presenting relevant data on graduate numbers along with a discussion of alternative destinations for those graduates is a sufficient treatment of their contribution to the skills supply. The complexities of where graduates of programmes of learning programmes go often make it challenging to reliably quantify how many graduates in a discipline that is in demand will be available for employment in the sector. Most skills anticipation analysis stops short of doing this.

However, if it is felt that detailed quantitative analysis of the supply actually available to the sector is essential, information on graduate destinations can be used as the basis for quantification. In some cases, providers of education and training will be able to provide sufficiently specific data on the proportion of their graduates who go to the sector, and about the state of competition for graduates from other destinations. It is important to be aware, however, that there can be substantial differences for a discipline between institutions for reasons such as geography or perceptions among recruiters. A more data driven approach is to use evidence from a survey of graduates, such as a first destination survey. This, supported by projections of graduate numbers and qualitative information on labour market conditions, can be used to estimate how many graduates will actually be available to the sector.

The relevant population might, for example be:

- Unemployed people with a specific qualification or who were in a specific occupation – may be available from the PES or labour force survey
- Unemployed people with at least a specific level of education – may be available from the PES or labour force survey
- People in a specific occupation working part time who say they are underemployed – may be available from a labour force survey

Supply from the existing pool of labour

Drawing from the existing pool of fully utilized labour means drawing on groups who are already fully employed, whether within the sector itself or from another sector.

While mobility between businesses in the sector does not add to the supply, upskilling people already employed in the sector potentially does. Estimating the potential supply is primarily about estimating the number of people suitable for upgrading – perhaps based on occupational data – and the proportion of these who can practicably be upskilled.

The scope for recruiting workers employed by another sector depends both on how many workers with the required skills are employed in other sectors and on how easy it will be to achieve a net gain in numbers from seeking to recruit them. From a wider policy perspective, it is necessary that STED should take account of the impact that this will have on other sectors, which will often constrain the reliance that a STED strategies can place on this source.

It may be possible to quantify numbers employed in other sectors from labour force survey data. It will usually be difficult to quantify analytically how many can be recruited. Interview evidence from firms or employment services may provide reasonable estimates, however.

Supply from inward migration

It is generally difficult to quantify with any precision how many people with a skill it will be possible to attract as inward migrants. Most often, the relevant questions to ask are whether there is a significant population of internationally mobile skilled labour available, whether the country and the sector are attractive to that population, whether regulations on inward migration will facilitate recruiting from the population, and whether they will come to the country on their own initiative or will only come if recruited actively. Based on the answers to these questions, it is possible to assess in broad terms what the constraints will be on recruiting inward migrants.

Placing a rough numerical estimate on what level of recruitment will be possible can be based on combining these qualitative considerations with data on existing inward migration for these roles, and perhaps on data on international skilled migration flows. Key data sources include the ministry or agency responsible for controlling or recording inward migration and the international literature on flows of skilled workers for specific sectors.

In many cases, where a sector is recruiting very highly skilled people from among its diaspora, a survey is conducted to gauge interest in returning home, and to quantify the numbers potentially available with particular types of skill or experience. In some cases, those interested in returning are asked to register their interest so that they can be contacted when suitable employment opportunities arise. This sort of investigation would not be undertaken within a STED initiative, but if it was undertaken by an industry association, development agency or other body it would be relevant to quote the results in the STED report.

5.2.4 Quantitative supply gaps

Quantitative analysis of supply gaps must take account of the diversity of available sources of supply, and of the actual requirements represented by quantitative projections of demand. A descriptive approach is usually preferable to simply calculating the difference between quantitative projections of supply and demand. In most cases, estimates both of supply and demand require significant interpretation, so a simple supply-demand balance can be misleading of not interpreted with care.

Typical conclusions would be along the following lines:

- "It looks as if the supply should be able to expand sufficiently quickly to meet the gradual rise in demand."
- "Supply and demand are roughly in balance right now, but we are projecting a large increase in demand, so shortages are likely if the numbers entering courses in the area do not increase steeply."
- "Courses in the area are not producing anything like enough people to meet demand, but businesses are upskilling people internally/recruiting from other countries so they are not really suffering from shortages. We expect that they will continue to be able to get enough people this way."
- "Just looking at the supply and demand numbers gives the impression that there are plenty of people, but in fact there are not enough because … many go to other sectors / many emigrate / only some of those apparently qualified are really suitable."
- "Looking at the supply and demand numbers gives the impression that there are not enough, but if businesses have problems getting exactly the skills they want … they are recruiting people with a related skill set and train them / recruiting from other countries / using sources of supply we have not included in the supply analysis."
- "We are seeing a serious shortage of skills right now, but that is because the skills required are new. Colleges are already responding to the shortage by creating new courses, and students are taking up places on the courses, so the shortage should end after two or three years."

It is helpful to root comparisons of future supply and demand in current labour market conditions. If the modelled balance between supply and demand for the current year is consistent with qualitative evidence on labour market conditions, then this provides evidence that the balance produced by the model is approximately right. If not, it provides information useful for either calibrating the model to more accurately reflect reality, or contributing to a sound interpretation of the model's projections.

5.3 QUALITATIVE SUPPLY GAPS

Analysing future qualitative supply gaps follows up on the analysis undertaken in Stage 3. Stage 3 addresses two questions:

- *What kinds of skills are required to bridge the business capability gaps identified in Stage 2?*

- *What existing skills gaps are there that would have to be tackled even if no attempt was made to tackle the business capability gaps?*

The qualitative skills gaps analysis looks at whether the list of skills that emerges from Stage 3 can be narrowed down to exclude issues that are unlikely to require a coordinated response.

- Will measures already in place resolve some of the skills gaps identified in Stage 3?

- Will some of the current skills gaps identified in Stage 3 become less significant over time, even if they remain unaddressed?

- Will some of the skills gaps identified in Stage 3 dissipate without coordination, as firms, individuals, workers' organizations, education and training institutions and other stakeholders respond normally to market forces? Sometimes skills gaps are transient, and arise just because it takes time for firms and other stakeholders to respond to the change that underlies them. Some evolutions in skills requirements are regularly handled by firms without coordinating with other stakeholders.

Applying these questions to the findings of the analysis undertaken in Stage 3 will produce a list of qualitative supply gap issues that require a coordinated response. In most cases, this will not take long to do. When it is addressed in a stakeholder workshop context, it may even be best to merge consideration of these questions with consideration of either Stage 3 or Stage 6, to avoid repetition.

5.4 BARRIERS TO TRAINING AND TO MAKING USE OF OTHER SOURCES OF SKILLS

There may be potential sources of skills supply that the sector will not make use of unless barriers to their use are removed. The list of types of supply of skills presented earlier in bullet point form under *sources of supply* can be used as a framework to structure thinking by STED analysts and consultations with stakeholders.

If a shortage of people with skills of adequate quality is expected, despite the potential availability of a suitable supply, then it is necessary to consider what the barriers are, and how they might be removed while respecting legitimate interests of the main stakeholders. This analysis is an important preliminary step to take before formulating a response. The following are some of the main issues that should be considered.

- *Barriers to providing necessary training*. Many of the possible sources of skills rely on training, whether provided at the expense of government, employers, the individuals concerned, workers' representative organizations or international donors. Major types of barrier include the following:

    - *Issues over who accrues the benefit*. Individual firms may be reluctant to invest the money and management attention required in training, partly out of concern that employees may leave with the benefit of training then accruing to other employers. Most governments see training specific to an individual firm as being the responsibility of the firm itself, although they may put in place a mechanism, such as a levy-grant scheme, to force firms to provide money for training. A common policy view is that firm-specific training should be the responsibility of the firm, while general training can be the supported by policy interventions if resources are available. In practice, however, it can be difficult to draw a clear line between the two.

    - *Organizational investment required*. Putting substantial training programmes into place requires a major investment of management time and attention, aside from the financial cost. If it takes workers away from the job at times when they would otherwise be working, there may be a significant short term cost in terms of disruption to normal business operations. Many firms, particularly small and medium enterprises and firms in which management has not been professionalised, have weak capabilities in training, and are not well equipped to make this organizational investment in training efficiently and effectively.

    - *Uncertainty about outcomes*. Many stakeholders do not have enough experience with applying skills development strategically to be confident that they will implement it well, or to be sufficiently confident that it will have the planned impact if it is implemented well.

- *Difficulty in funding the training*. An employer, an individual or even a government may be short of cash, and unable to fund even an intervention that is believed to offer a good return.

- *Division of costs versus benefits*. The costs of training can be split between employers, workers and other stakeholders in different ways, and ensuring that all involved feel they are gaining a fair share of net benefits can be challenging. In apprenticeships, there is usually a clear trade-off for both employers and apprentices, with the employer providing training and benefiting from work done at a low rate of pay, and the apprentice gaining economically valuable skills while earning enough to live. Outside the apprenticeship context, similar trade-offs are sometimes difficult to make. Some employers may find it difficult to justify investing in providing substantial training during paid working hours, while workers may be reluctant to participate outside paid hours because they do not see sufficient benefit to themselves (or indeed because they have more urgent things to do while not undertaking paid work).

- *Barriers to attracting people into training*. Simply making training available does not ensure that it will be taken up, unless it is a direct obligation of employment. Tackling this for substantial programmes of training or education means a combination of ensuring that the training actually leads to good economic and career prospects, and marketing these benefits to potential employees. It also means ensuring that arrangements are in place that will make it economically feasible for individuals to participate in training, whether this means providing the training at times and places consistent with trainees continuing to work, providing an income, or targeting a group that has some other source of livelihood (such as, for example, social welfare schemes for unemployed, disabled or retired people that allow participation in training).

- *Formal or informal constraints on inward migration or on internal migration within the country*. Even if migration control systems formally allow migration, if they place a substantial regulatory or administrative burden on migrants or on firms seeking to recruit them this may form an effective barrier to migration. More generally, people whose skills are in demand internationally are likely to go not just where the financial rewards are best, but also where they are made most welcome by employers, governments, fellow workers and wider society.

  Low barriers to migration can be enough if the economic opportunities in the sector are sufficiently superior to those from where migrants are to be attracted. However, in many cases it can also be necessary to put in place active interventions to promote employment in the sector to potential migrants, to reduce the effort required by individuals and firms to satisfy regulatory and administrative requirements, and to help migrants and their families to settle in and make a place in the host society.

5.5 CHECKLIST FOR STAGE 5: SKILLS SUPPLY GAP

When Stage 5 is complete, STED analysts …

		Importance
… should have done the following:	Collected and analysed available data on supply of skills	Required to the extent that data available
	Interpreted quantitative information on supply of skills and demand projections	Required
	Narrowed down list of qualitative skills issues from Stage 3 to exclude those likely to be resolved without intervention	Required
	Assessed barriers to training and to making use of other sources of skills	Required
… should have produced the following outputs:	Description of the main sources of skills supply for the sector, supported by quantitative data where available	Required
	Quantitative projections on skills supply	Where feasible given available data, and where considered useful
	Evaluation of current and future balance between skills demand and supply	Required
	Analysis of barriers to be used when formulating proposals in Stage 6.	Required, but only highlights to be included in Stage 5 part of report
… should have used the following information sources:	Evidence from interviews, workshops, stakeholders, questionnaires, graduate destination reports, and existing knowledge of researchers on where the sector sources its skills and could source them, and on barriers to training and making use of other sources of skills	Required
	Quantitative data from government ministries, agencies, education institutions, professional institutions, industry representative bodies etc. (see text of chapter) on graduate (TVET, university etc.) numbers, student/trainee numbers, new entrants, first destination	Whatever is available without excessive effort

STAGE 6: PROPOSED RESPONSES

6.1 SCOPE OF STED RECOMMENDATIONS

The main questions that STED proposals seek to answer are as follows.

- How can existing and anticipated future critical skills gaps be closed?
- How can existing training and education institutions better meet demand?
- What other sources of skills supply can be used?
- How can skill demand be better anticipated in the future?
- How can enterprises improve the skills of their workforce?

Based on these questions, a STED initiative proposes concrete recommendations for government, education and training institutions, and enterprises, and potentially for other stakeholders that may include industry/employer organization, employee representative organizations and professional organizations.

Which types of recommendations are directed towards which type of implementing organization depends on the institutional arrangements in each country, and on the practicalities of implementation. *For example, under some conditions a recommendation that a particular type of course be provided might easily be implemented by an education or training institution, with advice from industry, while under other conditions it might also require funding and permission from a government ministry or agency.*

Broad classes of recommendations include the following.

- Recommendations that a particular type of learning programme be put in place, modified or expanded to meet skill needs.
- Recommendations about changing institutional arrangements to improve the operation of the labour market in areas that may include:
    - Skills anticipation;
    - Public and private employment services;
    - Incentive systems (taxes, subsidies, etc.) for skill formation, trade and innovation;

  - Capacity-building initiatives such as train-the-trainer programmes to improve the capability of education and training institutions, employers and others to provide for skills needs;
  - Improving coherence between trade, industry, enterprise, investment, labour market and skills policies; and
  - Dialogue between social partners.
- Broader policy recommendations beyond the skills domain. While STED is designed to provide advice on skills, this advice is based on a wide ranging strategic analysis of the sector or sectors studied. A STED initiative may make firm recommendations beyond the skills domain if they are justified by the research and agreed by stakeholders. It may also point towards issues outside the skills domain where it is clear that further policy-oriented study is required.
- Suggestions regarding the implementation of recommendations.

6.2 LINKING ANALYSIS OF SKILLS REQUIREMENTS TO RECOMMENDATIONS ON LEARNING PROGRAMMES

6.2.1 Framework for linking skills analysis to recommendations on learning programmes

Most recommendations from a STED initiative follow from the analysis of skills gaps carried out in Stage 5. They will have come from three main areas:

- Consideration of the implications of business capability gaps that have been identified;
- Existing qualitative gaps in the supply of skills; and
- Existing and anticipated gaps in the quantity of skills available.

The process of forming STED recommendations is principally about identifying practical actions that can be taken to respond to each of the gaps that have been identified as being important.

Table 6.1 shows a framework that can be useful in linking between these issues and proposals for action that can form the basis for recommendations, taking agro-food in Bangladesh as an example. This example shows gaps from the business capability gap and qualitative skills gap analysis. If separate gaps in the quantity of skills have emerged from the analysis, they should also be inserted into the framework.

The example in Table 6.1 does not address the important step of generating options for action. In many cases, more than one option will be available. It is important to work creatively and systematically through what the options are before forming a view as to which is optimal.

In some cases, it may even be preferable for a STED report to set out more than one potentially viable option, and leave it to stakeholders to choose from be-

Table 6.1 Framework linking business capability gaps and existing skills gaps to proposals for action

	Business capability gaps/other gaps	Types of skills required	Proposal(s) for action (an illustrative sample)
Business capability gaps	Product Development	Graduates with skills relevant to food product development	Bachelor and masters degree courses in food science, food business and food engineering
		Educating existing managers, marketers etc. in food product development	Executive education courses.
	Operational effectiveness and food safety	Extented skills on	Food safety training and certification at all levels
		All levels of manufacturing operations:	Technician training
		• Operatives & technicians	Activity by professional societies
		• Production managers	
		• Food scientists	
		• Engineers	
	Regulatory Compliance	Awareness of importance of strict compliance across all levels of manufacturing operations	Courses in regulatory compliance for managers, supervisors and technicians
		Skilled Quality Assurance (QA) Managers	Substantive training for new and existing QA specialists
	Logistics / Supply Chain / Cold Chain Management	Logistics and supply chain specialists	Centre of expertise in logistics and supply chain
	Export marketing: Product management, channel management	• Marketing managers and staff	Executive education for marketing managers
		• Sales staff	Recruiting from diaspora
		• High level international business development staff	
	Supplier Capability	Skills of farmers (and other producers)	Short training courses
Existing skill gaps	Skills of apprenticeship-trained workers	Informality of most apprenticeships	Firms should move to comply with 2008 Apprenticeship Training Rules
	Waste due to deficiencies in agriculture skills	Knowledge of market requirements with exporting firms , and how to meet them	Advice from agricultural advisors, intermediaries or representatives of firms in sector

tween them. For example, in the STED study of the Kyrgyz garment sector a key issue was whether the much-needed action to provide better entry level training for sewing machinists should be delivered through the existing long-established TVET schools, or should be delivered mainly through new industry-led provision. While expressing a preference for improvement and reform in the TVET schools system, the report highlighted an industry-led initiative as a possible alternative course of action.

6.2.2 Key questions when generating and choosing from among options on learning programmes

For each type of skill required, it is necessary to tackle the following questions.

- Who should be targeted in order to obtain this type of skill for the sector?
    - Groups not yet in the labour force, such as school leavers, graduates of training courses, college graduates?
    - Specific occupations already employed in the sector? Which occupations, and what profile of people within them?
    - Skilled workers employed in other sectors? What occupations and which sectors?
    - Groups outside the formal labour force? Which groups?
    - Skilled workers from other countries? Broadly, which countries?
- What sort of intervention(s) should be used?
    - College-based initial education or training courses? Higher education or TVET level, and at what level of qualification within these? Full time, part time or some form of flexible or distance learning?
    - Apprenticeships? Other combinations of practice-based and classroom-based learning?
    - Continuing education and training, whether at an institution or attached to the workplace? Classroom-based? Laboratory-based? Workplace-based? Formal e-learning or blended learning approaches? Some combination?
    - Informal approaches to learning? Mentoring or team-leading? Learning from peers, whether within the firm or through meetings of professional groupings, informal networks or other structures? Self-directed approaches to learning, such as use of e-learning materials, texts, manuals or web-based material?
- What types of institution should lead, design and/or deliver the intervention(s)?
    - Established public TVET institutions?

- Universities or other higher education institutions?
- Training centres (including centres of excellence) of employer organizations, employee representative organizations or which are established on a bipartite or tripartite basis?
- Private providers of training?
- Other institutions associated with the sector such as professional groupings, employer or employee organizations (outside the training centre context), development agencies, regulators, research centres,
- Technical assistance project in collaboration with stakeholders?

- Who should pay for the intervention? (Development and start-up costs, ongoing cost of provision and cost of participants' time are all relevant, and may be paid by different stakeholders, or combinations of stakeholders.)
  - Establish within an existing framework of provision, using well established precedents as to how costs are allocated, versus creating a new framework or modifying an existing framework?
  - Employers or employer organizations?
  - Individuals or worker organizations?
  - Government –directly or indirectly?
  - International funding initiative?
  - Some combination?

When generating options, it is preferable to take an open minded and creative approach. Judging which options are most viable can wait until later.

6.2.3 Issues to consider when generating and choosing from among options on learning programmes

Points to bear in mind when identifying options for what actions may be possible and effective, and when later evaluating what is optimal from a policy perspective, include the following.

Existing framework of provision

If there are obvious solutions that can fit within the existing framework of provision, they should be included among the options. When it comes to evaluation, it should be remembered that it is usually easier to fit new education and training within existing frameworks if they work well, than to create a new framework. Working within well-functioning existing frameworks also benefits the coherence of the overall system of provision, and avoids unnecessary fragmentation.

Experience from other countries

Most of the skills supply challenges seen in the STED pilots had previously been seen by members of the STED analyst teams in the same sectors in other countries, and it was mostly possible to generate options by adapting what had been done elsewhere to conditions within the country and sector. Drawing on experience from other countries should be an important source of options for STED analysts.

Wider reform agenda

It is important to take account of any wider reform agenda in the country's education and training systems. In one STED pilot (Bangladesh), there was already a major programme of TVET reform underway, which created new options for training provision, and which could be supported by STED recommendations. Another pilot (Kyrgyzstan) was undertaken in the context of the early stages of a TVET reform initiative, and it was possible to propose that its recommendations be used in part to promote reform in the existing TVET system.

Typical patterns of provision of initial education and training

Initial education and training for some types of occupation follows fairly standard patterns internationally, but shows significant variety between countries for other types of occupation. STED analysts should try to understand both international patterns of education and training and established traditions within the country and sector being studies when developing and choosing between options. It is not possible to provide a comprehensive review here, but the following points will often be relevant.

- Training at skilled operative level tends to be undertaken by (or on behalf of) employers, although some occupations at this level have a history of substantial training being provided through formal TVET systems. Examples of the latter seen in pilots include sewing machinists in Kyrgyzstan and food processing operatives in FYR Macedonia. In many cases, there are significant problems with both traditional approaches and new approaches. Those trained by employers may be found not to get enough initial training and fail to become fully skilled and productive. In courses for some occupations in some TVET systems, trainees spend much more time in training than is necessary to develop the skills required, but are still not fully productive because their training does not meet current industry needs, being conducted on the basis of obsolete curricula and equipment, and by trainers whose skills are out of date. Options for recommendations are likely to include initiatives to strengthen training provided by employers, measures to improve formal TVET training provision, and initiatives to provide shorter formal TVET courses that could be delivered at the place of work or at TVET institutions.
- There is significant variety internationally in how initial education and training for mid-level technical occupations is structured. The line between craft occupations from ISCO 7 and similar technician occupations from ISCO 3 is often

blurry in practice, so it sometimes makes sense to analyse them together. Workers with technical skills equivalent to craft level are sometimes called technicians, and people with craft-type training may have technician level skills. There are two broad approaches to initial training of workers at this level – college-based approaches and apprenticeship-based approaches. College-based approaches ideally include some work experience, and apprenticeship-based approaches ideally include formal off-the-job training and formal assessments of competence. Both college and apprenticeship approaches can work very well, depending on conditions in the country and the sector. STED analysts should approach designing recommendations with an open mind, and should prioritise what will be seen as most workable by stakeholders.

Box 6.1: Industry-led skills development initiatives (initial and continuing) versus using mainstream TVET system

Based on experience from the STED pilots, an issue that may often appear is whether to establish a new industry-led skills development initiative or to make major improvements to provision from the country's mainstream TVET system to enable it to deliver the education and training provision required.

Lessons from the pilots include the following.

- When considered in detail, the issue will not necessarily be a direct choice between the two approaches. It may be desirable to share the task, perhaps with the mainstream TVET system focusing particularly on new entrants, with an industry-led initiative providing short courses to existing employees, and with more substantial continuing education and training interventions being undertaken by one or the other, or being split between the two. Design and piloting of new initiatives may benefit from collaboration.
- Decisions on the role of existing TVET systems in a sector cannot be taken in isolation from the interests of other sectors and of the country as a whole. Even if there are major problems in the capability of the existing system to meet the sector's needs, these wider interests typically favour reforming, improving and supplementing the system, rather than establishing a separate sector-specific system with the same functions.
- An industry-led initiative that depends on voluntary contributions from industry, and on providing paid services, may have difficulty in attracting resources comparable to those that are regularly channelled through mainstream TVET systems, and may therefore have difficulty in scaling up. If there are problems with an existing mainstream TVET system they may be caused in part by a shortage of resources, resulting in old equipment and difficulty in keeping course content up to date. It is important that choices as to the institutional channels through which interventions are made should take account of the availability, adequacy and stability of resources that may be available through each.

- Professional level engineers, scientists and computing specialists typically require at least a bachelor degree in their discipline from a university or equivalent. Many will also have masters degrees. Some masters degrees are designed mainly to raise the skill level of graduates. Some are designed to prepare graduates to specialise in a specific area. Demand for doctoral level (PhD) qualifications is most often associated with scientists (less frequently engineers or computing specialists) working in research and development.

- In some cases, systematic upskilling provides an important part of the supply of skilled workers that would otherwise be satisfied through initial education and training, with operative level workers being trained for more skilled operative or craft/technician roles, with lower level craft/technician workers being trained for higher level craft/technician roles, and with well qualified technicians receiving additional education or training to progress to the level of professional engineers or scientists.

Continuing education and training

Continuing education and training may be carried out for different purposes, and can take a wide variety of forms.

Training to satisfy regulatory requirements and training as a component of change programmes is effectively non-optional. There is a close and direct link between providing adequate training in these areas and business outcomes, which means that businesses can easily see and value the benefits of investing in training, as well as the harm caused by failure to invest adequately.

Outside these areas, the link between continuing education and training on the one hand, and business outcomes on the other, is typically more complex to track. An important consequence of this is that levels of activity in continuing education and training vary considerably between countries, sectors and businesses within sectors. Well managed businesses competing at the international level typically train more than others, partly because they understand how to use continuing education and training to improve business performance, partly because they are under competitive pressure to find sources of competitive advantage, and partly because their margins are typically high enough so that they can afford to invest in skills.

Levels of activity in continuing education and training may also vary between countries, whether because business traditions differ, because governments or workers' representatives promote continuing education and training to different extents, or because of differences in accumulated experience with using continuing education and training to achieve business objectives. Major purposes for continuing education and training that should be considered when developing options in STED include the following.

- **Training to meet regulatory requirements** – Regulatory requirements are a major driver of training in most sectors in developed economies. They are increasingly important in exporting sectors in developing and emerging economies as they modernise, as they face the need to comply with regulatory requirements

in the markets to which they export, and regulatory frameworks in their own countries become stronger.

Training in health and safety for most workers is frequently a regulatory requirement. Examples of other areas where sectors often have a widely focused regulatory requirement for continuing training include food handling in food and catering sectors, and anti-money laundering in financial services sectors. Where businesses are exporting to regulated markets, such as with pharmaceuticals, a credible programme of continuing training may be required as a component of the wider approval process.

In some cases, regulations drive a requirement for continuing training for narrower groups. Senior managers may be required to undergo training in company law when appointed and periodically afterwards. Members of professions may be required to undertake continuing professional development (CPD).

Where STED analysis shows that meeting regulatory requirements is an important issue for the sector being studied, it will often make sense to include recommendations on training required for regulatory compliance, whether because the regulations directly require training, or to provide the skills needed for compliance across all relevant occupations. In some cases, there will also be a need to provide specialist training in regulatory affairs to senior managers, senior engineers and scientists, and regulatory affairs professionals.

- **Training as part of change programmes** – In most exporting sectors, and particularly in sectors strengthening their position in export markets, businesses are continually interested in changing their operations and technologies to bring new products to market, control costs, improve quality, improve customer service, gain market access, and pursue other business goals. In many cases, businesses in developing and emerging countries find that they must transform themselves to compete effectively in international markets or against competition from imports in their domestic market.

  Examples of types of change programme include: introducing new or improved technologies; introducing new working practices (such as teamworking); introducing arrangements to comply with regulatory requirements; or structured improvement programmes such as Lean Manufacturing or the ILO's SCORE (Sustaining Competitive and Responsible Enterprises)[16] methodology. Change progammes require training for the employees that they affect, and programmes that affect significant numbers of employees can create a large requirement for training.

  Where STED analysis shows that substantial change programme initiatives are necessary, recommendations should address the skills and training implications

[16] www.ilo.org/score.

of the programmes at all levels of skill. In many cases, these programmes affect skills required by workers at a wide range of skill levels, including (in a manufacturing context) operative, craft, technician, supervisor, professional engineer or scientist and operations management. They will often require specific training in techniques required to undertake the change programme, specific training in new work practices and technologies required to operate in the changed workplace, and also training to improve core skills such as teamworking, literacy, numeracy, computer skills, problem solving and both written and verbal communications.

- **Continuing education and training for updating and upgrading skills, and for career progression** – Businesses use a wide variety of different approaches to building their workers' skills, in order to satisfy their own skills requirements, and often also to meet their workers' career needs. Appropriate skills development benefits both businesses and workers; for workers it is an important driver of both future pay levels and employment security (Anker et al. 2002).

  In many cases, there is more than one viable approach to meeting a skills development need through continuing education and training. STED analysts should approach designing recommendations in this area with an open mind, and should prioritise what will be seen as most workable by stakeholders.

Some of the key questions that STED analysts should consider about continuing education and training are:

1. What is the statistical or qualitative evidence on the level of continuing education and training activity that takes place? Relevant statistical measures for international comparisons include the percentage of workers who have taken part in training over a period, the average number of days training that workers have undertaken, or the amount spent on training as a percentage of payroll. If the volume of training in the sector is low, this will suggest that the STED report should recommend greater investment in continuing education and training.

2. Do deficiencies in the capability of businesses to identify their training needs and deploy training as a business tool constrain the volume of training undertaken? If so, this will suggest that the STED report should recommend investment in human resource management and training-related skills. Training courses for businesses in skills needs analysis, training needs analysis and train-the-trainer may be relevant.

3. Do deficiencies in the supply of training constrain the scope of education and training that can be undertaken or funded by businesses? If so, practical recommendations for improving the supply of training and the capabilities of education and training providers may be relevant. This may be a matter of

strengthening existing external providers, creating new providers, attracting specialist providers from other countries, or building up training capacity within firms.

4. If businesses in the sector recruit substantial numbers of workers with low skills, and put them to work with only a small amount of additional training, then a substantial training effort is required to improve and broaden their skills unless they are satisfied with a low skilled workforce. Firms that expect to retain employees for a significant period of time will generally get a better return from employees with better skills, even if they have to pay them more. Better skills typically benefit firms through higher output, higher quality, wider employee capabilities, greater flexibility, lower supervisory overhead and greater commitment to the job. Where firms in a sector recruit large numbers of low skilled workers and there are not already satisfactory arrangements in place for continuing education and training, a STED report on the sector is likely to recommend action to put formal arrangements in place. These are likely to include some form of formal training, whether at the workplace or at a training centre or education institution, ideally leading to the award of a qualification.

5. Are there any important areas within the sector where progression from one occupation to another (e.g. from operative to technician, from operative to supervisor or from technician to engineer) takes place, or would significantly improve skills supply if it did take place? If so, how well does existing training provision support it? If there is a gap, it may make sense to make a recommendation as to how it should be addressed.

6. Are there significant deficiencies in management skills, particularly at senior and middle levels? Continuing education and training is centrally important to the development of managers, many of whom enter management without a formal qualification in the area. Even those who already hold a management qualification benefit from continuing education and training. The skills of managers and entrepreneurs are especially important, both because they have a major impact on business performance, and because their own experience of education and training typically informs their approach to continuing education and training in the organization (or part of organization) they manage (OECD, 2002). If there are deficiencies in management skills relative to what is required to compete internationally, then it will typically make sense for a STED report to make recommendations in the area, which may focus on areas such as general management, entrepreneurship, international marketing, human resource management, or any other area of management deficiency. Appropriate responses can be varied, including short executive development courses, university business degree courses, courses that combine bringing peers together periodically in a classroom along with individual mentoring, and foreign study visits.

Informal approaches to continuing learning

Informal approaches to learning can make an important contribution to skills development, functioning both within businesses and through networks that exist outside individual businesses. Learning from peers has an important role in many sectors, particular at professional and managerial levels. Significant sections of the skills and understanding required are never formalised. In many cases, skills and knowledge required for a role are fluid, changing over time in ways that can be understood most easily by people working in the area.

Formal networks based around professional groupings, industry organizations and workers' representative associations often play an important role. Informal networks based on social contacts sometimes also play a significant role in learning. They may, for example, arise from similar companies being located close together, or from alumni of education and training courses staying in touch. The advent of social networking technologies can enhance this by allowing effective networks to operate over a much greater geographic area than in the past, for example allowing individuals in the sector to stay in touch with members of a diaspora who may be building valuable international experience.

It will often make sense for a STED strategy to seek to use informal networks as a vehicle for learning, particularly among professional occupations and among senior managers. This may, for example, be through recommendations about establishing or strengthening business and professional organizations, recommendations about bringing cross-firm peer groups together for training, or recommendations about connecting with members of the country's diaspora working in related sectors.

Paying for education and training initiatives to address skills objectives

The issue of who pays, and who should pay, for different types of training is the subject of an extensive literature. Gary Becker[17] has distinguished between training specific to one employer that would be paid for by the employer, and general training of value to multiple employers that would have to be paid for by the employee who would derive the economic benefit under perfect labour market conditions. His work predicted that, even under imperfect labour market conditions, the level of training undertaken would usually be less than economically optimal, as employers would not provide sufficient general training and most workers would not source it for themselves.

Becker also drew attention to free-rider issues. If some firms in a sector provide general training and others do not, the firms that do not train will be able to get the skills they need at the expense of the firms that do.

While empirical research has found that employers often do provide general training in practice (labour markets are imperfect after all), the insight that employers will typically only pay for training that benefits themselves underlies most policy thinking on paying for training.

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[17] See, for example, Becker (1993).

As a consequence:

- Most initial education and training is paid for either by the individuals involved or their government.
- In apprenticeship systems, the apprentice typically compensates their employer for training by accepting a relatively low wage while being trained.
- In some countries, efforts are made to change the incentives that employers face on general training. Some give employees an entitlement to a minimum level of training. Some place a levy on payrolls, and use this to fund shared training provision or training grants for businesses.
- In many cases, employers in a sector group together to organize and fund training, limiting free rider effects.

In cases where the level of training is much lower than optimal, there are frequently structural barriers to increasing activity quickly. Businesses may lack confidence in the return that is available from more training. The existing base of suppliers of training may be unable to supply the training that is needed. With limited experience of training, businesses may not be confident that they can identify their own training needs correctly or deliver training in a way that best delivers business results. There may be coordination problems, with businesses not ready to collaborate to attain scale efficiencies in training delivery, with suppliers of training not prepared to invest in developing new courses until they see demand, and with businesses not willing to procure training until they see capable suppliers.

In these cases, funding from outside the sector for innovation in training can play an important role in enabling a sector to transition to a much higher level of training activity. Once the transition has occurred, external funding can be scaled back or withdrawn.

In developed countries, this funding may come from government. In developing countries, international donors may provide funding. One example seen in the STED pilots was the EU-funded TVET Reform Programme in Bangladesh. Among other activities, the programme developed and funded training courses in key occupations for four sectors.

STED analysts should consider funding issues when formulating recommendations.

- If they identify a serious problem with underfunding in an area of education and training important to the sector, they should highlight this, and should consider making recommendations as to how it should be addressed.
- If they identify a useful role for international donors to assist in reforming and growing activity in education and training, they should highlight this in the STED report's conclusions.

6.3 RECOMMENDATIONS ABOUT CHANGING INSTITUTIONAL ARRANGEMENTS

The evidence of the four pilots undertaken is that STED research will often be undertaken in the context of education and training systems that are in need of reform, and may already be undergoing reform. Researchers will have investigated this wider context in the STED Stage 1 analysis. They will have taken account of the wider context while developing recommendations on specific types of course that should be provided.

In many cases, it will also make sense to comment on the wider institutional context, and make suggestions about changes to institutional arrangements that may be required in order to deliver the changes that the sector requires, and in order to make the system more responsive to skills issues that arise in future.

6.3.1 Skills anticipation

STED is a form of skills anticipation (anticipation of future skills needs) and skills needs analysis targeted at the level of a sector. It will usually be applied to sectors where there is no existing skills anticipation process, or where there is an existing process that is weak.

Skills anticipation for a sector should be reviewed or repeated periodically, as the sector and its environment change. STED analysts should consider recommending how future skills anticipation for the sector should be approached, and whether it is useful to make wider recommendations on skills anticipation to cover other internationally traded sectors and the economy as a whole. Dialogue between social partners is fundamentally important to identification and anticipation of skills needs. Any STED report should be explicit about this.

Successful institutional approaches to skills anticipation generally bring together representatives of the main stakeholders interested in skills for the sector, including employers, workers' representatives, government ministries and agencies and providers of education and training to the sector. In order to be effective, they require the support of a secretariat capable of undertaking or managing skills research, and responsible for managing the skills anticipation agenda from day to day while stakeholder representatives provide advice and governance for the process.

Skills anticipation institutions take a number of different forms in countries where they are well developed.

- Some, mostly larger, countries have established systems of Sector Skills Councils. A Sector Skills Council is typically made up of representatives of the main stakeholders interested in skills for the sector, including employers, workers' representatives, government ministries or agencies and providers of education and training to the sector, supported by a secretariat. Typical functions include skills anticipation, and also involvement in designing qualifications and in developing

courses, coordinating collaboration between stakeholders, stimulating innovation in education and training, and sometimes an involvement in areas such as quality assurance and funding for education and training. Examples of countries with well-established Sector Skills Councils include Australia and Britain. Bangladesh is developing a system of sector skills councils. Countries with Sector Skills Councils have also established national level councils to coordinate and integrate the work of the different sector level councils, and to take responsibility for cross-sector initiatives.

- Other countries spread the functions of Sector Skills Councils across a range of mainly sector level institutions. Many of these establish skills and employment observatories to undertake work on skills anticipation, in order to inform the work of other institutions and of stakeholders, many of these being existing sector level institutions.

- Some, mainly smaller, countries establish a single central skills anticipation institution at national level, with national level representatives of the social partners and other stakeholders. Examples include Ireland and Estonia. These undertake both sector level and national level skills anticipation work, engaging the involvement of sector level stakeholders when relevant.

- In cases where there are very strong existing sector level institutions that bring together the main stakeholders, there may be no need for separate institutions for skills anticipation. Germany provides a good example of this.

These different approaches to skills anticipation reflect the wider institutional context in the country. STED analysts should consider the context in the country and sector concerned when proposing recommendations, and should not have preconceptions about which of the institutional approaches described above will be most appropriate.

Whichever institutional approach is preferred, there will be a need to develop a capability in skills anticipation in the country. This would ideally be located initially in a central unit, such as the secretariat of the national level council in a Sector Skills Council system, a central coordinating group in a system of sectoral observatories, or the secretariat of a central national skills anticipation institution. The number or people requiring training will not necessarily be large. Some countries with effective skills anticipation systems operate with a small team of specialists – as small as three or four – who have access to support from the resources (including statistical units) of other institutions, and who may commission research from consultants or academics as required.

The specialists responsible for skills anticipation will require training. This could usefully include a training course in STED, ideally along with a period of mentoring. STED is suited to any sector exposed to international trade, and there is much in it that is applicable to analysis of any sector.

6.3.2 Capacity building initiatives

In order to deliver education and training initiatives effectively, it may be necessary to improve the capacity of the system and its constituent parts to deliver at a high level of quality. Some of the areas where action may be required include:

- Train-the-trainer programmes to improve the teaching skills of educators and trainers, in institutions, in businesses and in private providers of training. These can range from being short in duration to being very substantial, at the level of a masters degree.
- Curriculum development. In many cases, there is a need for investment in new curricula and in learning content to enable the curricula to be delivered.
- Qualifications systems. In some cases, there is a need to update existing qualifications. This may be done for a group of qualifications or through a wider process of reform leading to the introduction of a National Qualifications Framework. Before deciding to recommend a National Qualifications Framework, STED analysts should review the literature, including the review on the topic commissioned by the Skills and Employability Department of the ILO (Allais, 2010).
- Depending on the recommendations made on course provision, it may make sense to make recommendations about building up private sector training capacity, particularly for continuing education and training. Businesses can collaborate on building capacity among providers, for example by establishing a centre of excellence for their sector, or establishing training networks for joint procurement of significant volumes of new types of training.

6.3.3 Sourcing skills from other countries

Aside from using education and training to supply skills needs, sourcing skills from other countries may also be a viable alternative. When considering what recommendations can be made, it is necessary to consider what groups will be targeted, how actively it will be necessary to pursue them, what their needs will be, and whether any legal or policy changes will be required in order to allow them to enter and pursue a career within the country. Examples of measures that might be addressed in recommendations include:

- Actively seeking members of the country's diaspora with high level skills relevant to the sector to return through industry networks, advertising in media likely to be seen by their extended families, targeted headhunting etc.
- Establishing efficient administrative systems in ministries and agencies that control immigration to allow enterprises to obtain permission for skilled employees to enter the country, reside and work. Efficient systems to obtain permission for short term working visits are also important.

- Resolving clearly what entitlements workers from other countries will have in areas including long term residency, access to healthcare and social welfare, and inward migration by family members amongst others.
- Establishing mechanisms to enforce decent working conditions for immigrants similar to those for established residents.

6.3.4 Funding and incentive systems for education and training

When formulating recommendations about provision of education and training courses, STED analysts will have taken account of funding issues that affect those courses.

If there are significant broader deficiencies in education and training provision that are important to the future competitiveness of the sector that can be attributed to funding issues, the researchers should consider recommendations as to how these can be addressed. This may be just an exhortation that employers, government, workers' organizations, donors or others should put more resources into specific areas of education and training. Researchers should be cautious about making broad recommendations in these areas, and any recommendations made should be agreed with stakeholders. Incentive systems mostly apply across a range of sectors, and as their design involves complex choices about the economic relationship between government and business that may be hard to analyse thoroughly within the scope of a STED study.

6.3.5 Public and private employment services

Employment services play an important role in matching skills needs to the pool of available skills. They can also play an important role in sourcing skills from other countries. Many public employment services play an important role in connecting people who are unemployed with training opportunities. Employment services can, in addition, be very good sources of current data and qualitative information on labour market conditions and on current demand and supply for specific skills.

If the research shows that there are difficulties in any of these areas on which public or private employment services could make a significant contribution, then STED analysts should consider including a recommendation.

6.3.6 Coherence between trade, industry, enterprise, investment, labour market and skills policies

A basic principle underlying STED is that there should be coherence between a country's policies on trade, industry, enterprise, labour market and skills. A STED initiative's conclusions on skills are principally driven by a strategy to boost the capabilities of enterprises in sectors affected by international trade.

If STED research shows a lack of coherence between policies in these areas that causes significant problems for the sector or sectors targeted, then STED analysts should note this in the report and should consider making a recommendation on it.

6.3.7 Recommendations beyond the skills domain

A STED initiative may make firm recommendations beyond the skills domain if they are justified by the research and agreed by stakeholders. It may also point to issues outside the skills domain where further policy-oriented study is required.

6.3.8 Recommendations on implementation

STED analysts should consider including recommendations on implementation. These will depend on the institutional context in which the STED initiative has been undertaken.

- In many cases, it will be appropriate to propose either that an existing stakeholder grouping should take responsibility for prioritising recommendations for implementation, and for driving implementation forward, In other cases, it will be appropriate to propose that a stakeholder group should be established for this purpose, and that one or more specific stakeholders should take a lead in ensuring that the group is formed and operates effectively.
- In some cases, it will be possible to be prescriptive that specific organizations should undertake specific actions.
- In some cases, it will only be possible to point towards broad groupings of stakeholders, such as employers and their organizations, government and its ministries and agencies, workers' representative organizations, universities, public providers of TVET, other training providers, regulators etc.
- In general, it is important that implementation of the conclusions and recommendations of skills anticipation should be reviewed and evaluated. It will often be appropriate that a STED report should recommend this.

6.4 CHECKLIST FOR STAGE 6: PROPOSED RESPONSES

When Stage 6 is complete, STED analysts …

		Importance
… should have done the following:	Developed proposals / recommendations based on the findings of the earlier stages.	Required
… should have produced the following outputs:	Proposals / recommendations on the provision of learning programmes to meet future skills needs	Required
	Proposals / recommendations about changing institutional arrangements	Required if useful proposals can be indentified
	Proposals / recommendations beyond the skills domain	Optional
	Proposals on implementation	Required
… should have used the following information sources:	Findings from Stage 5, and information from obtained in earlier stages	Required
	Stakeholder views	Required
	Recommendations from STED initiatives on similar sectors in other countries	Optional, but potentially helpful

THE STED PROCESS

STED uses different empirical methods, which typically include desk research and statistical analysis by trade and skills experts at ILO Headquarters, field research through structured interviews which is often supported by local consultants, and stakeholder workshops in the country. Where possible, quantitative modelling is carried out by a skills expert at HQ level based on data obtained in the country. A designated ILO staff member or lead consultant is responsible for preparation and editing of the final report.

The six stages outlined in previous chapters provide the conceptual framework for the analysis undertaken in STED. However, they are not designed to be undertaken in chronological order in STED work on a country. It is useful to begin with desk analysis for stage 1, but country visits and workshops should be used as efficiently as possible to collect information and discuss preliminary findings of relevance for all stages. It is usually best to approach each stage recursively – improving the analysis as more information and perspectives are gathered – rather than endeavouring to get each stage exactly right first time around.

Figure P.1 shows a model process for a STED application. In practice, this will often have to be adjusted, taking into account country or sector specific needs or time constraints. If sufficient resources are available, a number of sectors fitting the STED profile can be covered in parallel.

Figure P.1 Typical STED process

Desk Review / Secondary Research

(ILO Headquarters Trade and Skills Experts)

Initial sector selection and characterisation based on available data, literature, and consultations with ILO constituents.

1st Stakeholder Workshop

(Ministries of Labour, Trade and Education, Workers and Employers Representatives by sector, Education and Training Institutions, others as relevant):

- Validation of sector selection and initial findings
- Discussion of sector growth scenarios , capability constraints, and skills gaps
- Agreement on STED process organization and further involvement of stakeholders

Draft Report

(ILO Headquarters Trade and Skills Experts, Local Consultants)

The first draft of the report is written based on findings from the workshop and desk review complemented by structured interviews with firms and other stakeholders in the sector and additional data collection if necessary. Proposed responses take into account a review of good practice in other countries.

2nd Stakeholder Workshop

(Ministries of Labour, Trade, Industry and Education, Workers' and Employers' Representatives by sector, Education and Training Institutions, others as relevant):

- Validation / discussion of draft report
- Discussion of proposed responses
- Agreement on follow up activities

Final Report

(ILO Headquarters Trade and Skills Experts, Local Consultants)

The report is finalized based on the feedback received during the second workshop and distributed to stakeholders

Follow Up / Implementation

Follow up and implementation of recommendations can be supported through

- a STED-specific implementation phase
- integration with other relevant technical assistance projects
- capacity building on skills anticipation for government and other stakeholders based on the STED approach

Box P.1: STED Partnership with the Bangladesh Employers' Federation (BEF)

In Bangladesh, STED was applied in close partnership with the Bangladesh Employers' Federation (BEF). This had several advantages in terms of both logistics and ownership and potential for follow up.

The consultant team who conducted the enterprise interviews in Bangladesh was recruited through BEF, which facilitated the identification of experts with knowledge of the industries covered and access to firms, which is often a question of personal contacts and relationships. In addition, BEF hosted the second stakeholder workshops in its own conference facilities and provided its network to assist in identifying and inviting key stakeholders. BEF disseminated the final report to its members with a joint accompanying note by the ILO Country Director and the Secretary General of BEF, thereby greatly enhancing its impact and potential for follow up action from the industry itself.

In order to facilitate access to information and increase the likelihood that recommendations will be implemented a key success factor for STED is to involve local partners, and to ensure that stakeholders have ownership of the results.

ILO's strong relationship with labour ministries, unions, and employers' organizations facilitates access to well-positioned partners for STED. These partners are systematically involved in the process from the beginning, including in the selection of sectors.

In some cases, tripartite institutions for social dialogue on skills already exist as natural counterparts in a country. In other cases, STED brings the relevant stakeholders in a sector together for the first time, and thus lays a foundation for social dialogue on skills and better policy coherence based on a strategic vision for a sector's future.

Another important aspect to promoting ownership and increasing the likelihood of implementation of STED recommendations is to align STED work with existing strategic planning for the sector. Apart from incorporating existing formal or informal strategic plans in the formulation of the vision of a sector's future, this also means paying close attention to ongoing processes for strategy formulation and implementation and – where feasible – aligning STED to such initiatives.

LOOKING AHEAD

The process of applying STED by itself contributes to improvements on the ground by raising awareness and stimulating dialogue on skills development among stakeholders within a sector. However, many of the recommendations from STED have a long term perspective. Planning a STED initiative should therefore include provisions for follow up activities to support implementation. These can vary in scope and set-up and are not necessarily restricted to purely skills related activities.

The decision on how they are best set up will strongly depend on country specific circumstances, available resources, and ongoing work by ILO and others in the sectors covered by STED. Generally, one or several of the following paths can be pursued for follow up and implementation:

- If STED is applied as a stand-alone project, resources can be factored in to support follow-up activities with a short or medium perspective. This can for instance involve providing funding and technical assistance for the development of new curricula or other targeted support to training institutions that have been identified as crucial. It can also include identifying and funding training or training of trainers to address specific needs identified as priorities. If a longer time horizon is envisaged, this can also include support for building an institution for skills anticipation and skills policy advice, which might be established at national or sector level.

- The STED methodology can be used for capacity building and support to existing institutions for skills anticipation and education planning. In this case, the focus is on transmitting to the relevant local institutions the ability to apply STED independently on an ongoing basis.

- STED can be embedded in broader technical assistance projects in the areas of skills, trade, sectoral and private sector development, and employment promotion. The analytical results from STED will inform follow up work through established ILO methodologies in areas such as Technical and Vocational Training reform, dialogue on trade and employment, skills anticipation, labour market information systems, promotion of life-long learning, youth employment and enterprise development.

Last but not least, the integration of STED into multi-agency projects is a promising path. In particular, STED can add a skills and employment perspective to trade related assistance projects. As a member of the UN CEB Cluster on Trade and Productive Capacity, ILO is working with partner agencies in the field of trade related technical assistance. Within the logic of such multi-agency projects where each agency contributes according to its specific technical expertise, STED can make a strong contribution through bringing the ILO's experience with skills development into a holistic strategic approach to sectoral export development.

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APPENDIX

SAMPLE STED INTERVIEW QUESTIONNAIRE - BANGLADESH AGRO-PROCESSING

1. Which products does your company produce?

_____
_____
_____
_____
_____

2. What was your total annual turnover in 2010? What has been the growth rate of output over the last 5 years, and how do anticipate growth over the next 5 years? How much of the growth over the next 5 years do you expect to come from export markets?

_____
_____
_____
_____
_____

3. Of your total output, please indicate what share is:

a) Sold domestically _____

b) Exported directly _____

c) Exported through an intermediary _____

4. (if company is exporting): What are your main export markets, and how many countries do you export to in total?

_____
_____
_____
_____
_____

5. What share of this company is owned...

a) private domestically _____

b) public domestically _____

c) foreign _____

d) other _____

6. What do you see as the best opportunities for growth available to your business and similar businesses over the next five years?

_____
_____
_____
_____
_____

7. What do you see as the biggest threats facing your business and similar businesses over the next five years?

_____
_____
_____
_____
_____

8. What export markets for products similar to those of your business appear most attractive?

_____
_____
_____
_____
_____

What products? What countries? What types of customer (mainstream market, ethnic, price sensitive …)?

_____
_____
_____
_____
_____

Which of these are you already in?

_____
_____
_____
_____
_____

Which do you think your business, or similar Bangladeshi businesses, are likely to enter seriously?

_____
_____
_____
_____
_____

10. What types of sales and distribution channels do you use now in export markets? Which do you expect to be most significant in future?

- Distribution businesses _____
- Agents _____
- Sales force employed by your business in the target market _____
- Selling to major retail chains _____
- Other (please specify) _____

11. Please answer the following questions for your company as a whole and – to the extent possible – for each occupational profile.

	Number of workers in core workforce	Peak number of seasonal workers	What education and training background do recruits usually have	What institutions usually provide this education or training?
TOTAL				
Food processing operatives				
Packaging operatives				
Factory supervisors				
Quality assurance and food safety workers				
Equipment technicians				
Laboratory technicians				
Engineers				
Food scientists				
Purchasing staff				
Marketing staff				
Sales staff				
Transport workers (drivers etc.)				
Administrative, clerical and accounting workers				
Workers in support roles such as catering and security				
Production managers and other factory managers				
General managers and other non-factory managers				
Other (please specify) …				
Other (please specify) …				
Other (please specify) …				

	Current number of unfilled vacancies	Difficulty of finding workers with appropriate skills (1-5, s most difficult)	How do you anticipate your labour demand to change under the growth scenario described in B7?
TOTAL			
Food processing operatives			
Packaging operatives			
Factory supervisors			
Quality assurance and food safety workers			
Equipment technicians			
Laboratory technicians			
Engineers			
Food scientists			
Purchasing staff			
Marketing staff			
Sales staff			
Transport workers (drivers etc.)			
Administrative, clerical and accounting workers			
Workers in support roles such as catering and security			
Production managers and other factory managers			
General managers and other non-factory managers			
Other (please specify) …			
Other (please specify) …			
Other (please specify) …			

12. Overall, to what extent do you hire people straight out of education and training, and to what extent do you hire people who are already experienced?

13. Do you provide organized apprenticeships or traineeships? For what types of jobs? Approximately what intake each year?

14. How sufficient is the supply of people available for recruitment? For what types of job (if any) are there problems in terms of either the suitability of the people or the numbers available?

15. How satisfied are you with the education and training courses that people you recruit have attended? (Please answer separately for different types of course.) What changes (if any) would you like to see?

16. How happy are you with the skills of your existing workforce for the work they currently do?

What improvements would you like to achieve?

What are the barriers to achieving these improvements?

Can you provide suitable training? Can you source suitable training?

17. Looking forward five years, what will your business need to be able to do better to succeed in export markets, or to compete effectively against imports into Bangladesh?

Please rate how important better capabilities in each of the following areas will be for your business's success in future.

	Not Important	A little important	Very important	Critically important
Sourcing high quality agricultural or aquaculture inputs				
Collaboration with farmers				
Cold chain				
Efficient manufacturing operations				
Short production runs				
Safe handling of food				
Quality management				
Product development				
Regulatory approvals				
Regulatory compliance				
Marketing within Bangladesh				
International distribution channel management				
Selling to major retail multiples (e.g Carrefour)				
International marketing				
Brand development				
International consumer research				
Other (please specify...)				

18. Thinking in turn about each of the areas where have rated your business's need for better capabilities as very important or critically important, what are the skills implications?

Please think about this both in terms of existing types of job and new types of job.

Please also think about it in terms both of the content of skills needed and the number of people needed with those skills.

What are the most important other implications that are not directly related to skills?

19. What are the implications of each of the skills needs we have discussed for education and training?

Are new courses needed? What courses? What format should they take? What types of organization should provide them? What should the industry do to help shape the courses?

Please think about both initial education and training and training for people who are already employed. Please think about both long and short courses, at all levels from operative to senior manager or researcher.

Are other changes to the education and training system needed?

STED
Skills for Trade and Economic Diversification

Equipping a country's labour force with the right skills set is one of the most critical factors for success in today's fast-moving and globalized markets. It is an important determinant of firms' competitiveness, and will contribute greatly to the creation of employment, in particular for the young.

The ILO has designed a technical assistance tool that is intended to help policy-makers and constituents think strategically and jointly about the skills demands in a rapidly evolving world and about the required supply responses. The tool is called STED: Skills for Trade and Economic Diversification.

This manual is intended to provide practical guidance to those implementing or commissioning technical assistance projects in the area of skills policies for sectors exposed to trade. Based on the experience in four pilot countries (Bangladesh, Kyrgyzstan, the FYR of Macedonia and Ukraine) a six-stage process is presented that is typical for a STED analysis and which leads towards the formulation of concrete recommendations at the policy, institutional and enterprise level for the design of skills policies in a context of global competition.

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