



Assessing the demand for labour in the Capital Goods Sector in Maharashtra

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Executive summary

Introduction

The capital goods sector is regarded a strategic sector for the development of India's economy, which is why the development of capabilities for the sector is considered essential from the perspective of national self-reliance and security. The capital goods industry contributes 12% to the total manufacturing output and about 1.8% to the country's Gross Domestic Product (GDP).

In May and June 2015, the India –EU skill project and the Capital Goods Skill Council (CGSC) have conducted an enterprise survey among capital goods companies in the state of Maharashtra. Maharashtra is the second largest state in India with a relatively high Gross State Domestic Product (GSDP), which has been growing rapidly over the last few years. The industrial and service sectors account for 23% and 64% of the GSDP respectively while the remaining 13% comes from the agriculture sector. This contrasts with the distribution of labour force over the different sectors, i.e. 64% in agriculture, 14% in industrial sectors and 22% in services. A large number of workers work is estimated to work in the unorganised sector and unorganised workers are present in most economic sectors.

The project recruited external interviewers to collect primary data during structured interviews. The focus of the study was on assessing the occupational structure, human resources management practices and skill needs in the capital goods industry, as well as on the collection of information for the development of curricula for CNC-Setter-cum-operator and Fitter-Fabrication. The findings and conclusions are mostly of a qualitative nature, meant to better understand the composition of the labour force, employee turnover, recruitment and selection practices and problems, expected economic developments, workforce training practices, the nature and problems in relationships between companies and training providers, etc. In short, the collected information would need to improve our understanding of labour market developments in the sector in Maharashtra, allowing for appropriate measures and initiatives, for example in the field of education and training.

This being the first of its kind survey for the Capital Goods Sector, the response rate was low so the researchers had to adopt a non-probability (i.e. not random) method of "snowball sampling" or "referral sampling". Though some unorganised sector companies took part in the survey, the main focus was on the organised sector, commencing with the members of sub sectoral associations represented on the Governing Council of Capital Goods Skill Council. Taking this into account, as well as the fact that the findings of the study cannot be compared to the results of any previous surveys, it is recommended to validate the finding with one or more future surveys.

Participating companies and their workforce

Representatives of a total of 105 companies participated in the enterprise survey. The two biggest sub-sectors were machine tools, and dies, moulds and press tools. Smaller sub-sectors in the survey are light engineering goods, other capital goods sectors, and the unorganised sector. Half of the companies were based in Pune, almost a third in Mumbai, and 10% and 8% were based in Aurangabad and Nashik respectively. In terms of the number of workers, 41% were small size companies, 37% medium size, 13% large, and the remaining 9% were from the unorganised sector.

Companies that took part in the survey had on average 220 workers and 6.5 vacancies. On average they had 70% permanent employees, 12% contract workers, 10% temporary employees and 5% trainees. Only 1% of the positions were vacant and the share of casual workers was negligible.

In terms of number of workers, companies producing dies, moulds and press tools were relatively small with an average of 88 workers. This was also the case for companies based outside Pune, especially in Konkan division where the average number of workers was 60. The average number of workers in the participating unorganised sector companies was 6.3.

In terms of vacancies, small and medium-sized companies had a higher vacancy rate than other companies, i.e. 3% and 4% on average respectively. This was also the case for companies producing dies, moulds and press tools, where 6% of the positions were vacant on average. The vacancy rate in Pune was lower than in the other divisions (i.e. 1% versus 2%) and higher in unorganised sector where 7% of the positions was vacant.

Though there were major differences in the composition of the workforce in the different sub-sectors, six job role categories accounted for more than two thirds of the workers in the most common job roles in the participating companies. These job role categories are:

- Design Roles - Designer / draughtsman
- Machinist Roles - CNC operator
- Machinist Roles - Conventional machine operator
- Production Roles - Assembly - Fitter – Mechanical / Maintenance
- Welding and Related Roles
- Projects and Planning Roles

The number of vacancies for CNC operators and project and planning roles is relatively high compared to the number of workers in these job role categories. On the other hand, the number of vacancies for welders and related roles and for fitter – mechanical / maintenance is relatively low.

Employee turnover and recruitment

Two out of five companies reported that turnover was higher for staff in the most common job roles than in other job roles and 58% reported recruitment problems for these job roles. The higher turnover concerned 11% of the most common job roles and recruitment problems were reported for 22% of the most common job roles. Retention strategies involved mostly financial measures, though non-financial measures have been reported as well.

Skill related problems were mentioned for 10% of the most common job roles, especially for CNC operator job roles, followed by tool and die makers, conventional machine operators, welding and related roles, and for marketing, research and service roles.

Unorganised sector and small companies used especially informal recruitment methods (like recruitment through word of mouth, of walk-ins, through the network of the company, etc.), whereas medium-sized and large companies preferred a combination of informal and formal methods (such as recruitment via a training institute, advertisements on internet, etc.). The employment exchange was not a favoured recruitment method by any category of companies.

Almost half of the participating companies recruit employees from all over India and a third only from the places near the companies. Selection criteria vary significantly between sub-sectors. For example, unorganised sector companies gave little importance to certificates, diplomas or degrees but preferred to recruit underqualified workers, while having the right qualifications was much more important for larger companies. Work experience is more important for smaller companies than for larger ones, and micro-sized and large companies laid greater importance to references of previous employers than small and medium-sized companies. None of the companies want to work with over-qualified workers.

Women and people with disabilities

Though two thirds of the companies employed women, the share of women in the workforce is not big (i.e. 4%). The situation is similar for persons with disabilities: 13% of the companies had employed one or more persons with a disability but the share of this group in the labour force is negligible. Nevertheless, half of the respondents indicated that they would consider recruiting women and 30% would consider recruiting disabled persons for the most common job roles. When asked to specify for which job roles, respondents indicated that they would recruit women for job role categories like designer / draughtsman, CNC Programmer, CNC (setter cum) operator, and quality, managerial and supervisory roles. Fewer job role categories were mentioned for disabled people, i.e. CNC Programmer, designer / draughtsman and CNC operator.

Opinions on the economic situation

When respondents were asked to rate the current economic situation, the responses were not very positive. Respondents of companies producing dies, moulds and press tools and respondents of companies based in Pune are more positive than others, while respondents of unorganised sector companies and respondents of companies based in Konkan rate the situation more negative than others. On the other hand, the workforce of the respondents' companies did increase in the last year. The reported increase was bigger for companies producing dies, moulds and press tools, as well as for companies based in Konkan division and for medium-sized companies. The increase involved especially job role categories like CNC operators and assembly fitters mechanical/maintenance, and to a lesser extend marketing, research and service roles. Decreases were reported for quality roles, helpers and component fabrication and preparation.

The respondents appeared positive about the future: three out of four participants believed that the economic situation will improve in the year to come, especially of companies producing "other" capital goods¹. About two-fifths of the companies plan for capital investments, which can be regarded as an indicator of the level of confidence of the participating business representatives. The majority of the capital investments plans concerned the adoption of new technology that will change the way of working in the company. Respondents expected that the workforce will grow in the year to come, but only a few companies specified the job roles for which this would be the case. The ones that did, mentioned especially fabrication fitters, CNC operators, conventional machine operators and staff in project and planning roles.

Training of employees

Practically all companies train new employees.. The most common type of training was on the job and about a third of the participants had non-formal/structured training programme in the company. Slightly fewer companies used formal training by an outside provider.

Two out of five participating companies had a direct relation with training providers. The nature of the relationship between the companies and the training institutes differed, but recruitment activities were an important part. Another important element was that apprenticeship students or trainees of the training institutes were placed in the company, and a third of the companies co-operated with visits of the students to the company. A very small number of companies provided the institutes with training facilities. Typical concerns when dealing with training providers were the use of outdated curricula resulting in students lacking necessary knowledge and skills, the institute's staff

¹ Other capital goods are specified in Table 2, and include companies producing process plant equipment, tools & gauges, power & electrical equipment, textile machinery, and material handling and lifting equipment.

lacking skills, students lacking motivation, and the absence of a good training infrastructure in the institutes. Many participants remarked that there is a gap between the quality of the students with a certificate or diploma and the needs of the companies and that training should be up-to-date and with a strong “practice oriented” component.

Employee benefits

Most common employee benefits were medical insurance or medical services for employees, bonuses and paid leave days. Other employee benefits offered by a relatively big share of respondents were bonuses and gratuity.

Respondents have given the minimum and maximum wages they would need to pay when recruiting new employees and contract workers for the most common job roles. The wages for employees are substantially higher than for contract workers. It seems that contract workers are especially hired for relatively simple jobs which would justify a lower rate, and jobs that require dealing with strategic information are generally not done by contract workers. The range between the minimum and maximum rate for employees is much larger for some job role categories than for others. For example, for categories like designer/draughtsmen, quality roles, projects and planning roles, and marketing, research and service roles, the rate range is much larger than for welding and related roles, helpers, and CNC setter cum operator roles. This suggests that the first mentioned group of job role categories offers potential for professional growth, while employees in the second group of job role categories have less room for growth.

Conclusions

Based on the findings, the experts have formulated several recommendations on the following subjects:

1. The role of the CGSC in future labour market analyses
2. Determining the share of the unorganised sector in the capital goods sector
3. The use of the most common job roles identified during this labour market analysis when updating the National Occupational Standards/Qualification Packs (NOS/QPs)
4. The need for labour market analysis on a regular basis to understand fluctuations and differences in the labour market.
5. The role of public and private employment services organisations, the possibility that retention strategies can conflict with recognition of prior learning initiatives, targeting labour market shortages by targeting less common groups of workers (like women, workers with a disability) and the planning of education and training based on the location of the demand for labour
6. The need for skill development programmes to target job roles for which there are current shortages (i.e. high turnover, recruitment problems, skill problems)
7. The need for training providers to take an active role in collaboration with employers to offer training with more opportunities for the students to acquire practical skills, the need to review the use of equipment and tools in the training centres in vocational education, the role of training providers in the upgrading of skills of the current workforce and the need to develop or evaluate curricula based on the inputs of employers.
8. The need to include information about career paths in the NOS/QPS, career progression as retention strategy for all workers and the inclusion of career path information in curricula development for education and training.

The information about CNC-setters-cum-operators and fitters-fabrication, which was collected through a separate questionnaire, has been briefly presented in this report and will be used to evaluate curricula for these job roles.

1 Introduction

1.1 The India EU Skills Development Project

The India-EU Skills Development project funded by the European Union assists the National Skill Development Agency (NSDA) and selected State Skill Development Missions (SSDMs) and Sector Skill Councils (SSCs) in implementing policies aimed at skilling a large numbers of Indian men and women to increase their employability and entrepreneurship, as a precondition of economic and social development. The project does this by using international experience for developing institutional capacities in the Indian context, by helping to define standards and procedures of implementing the National Skill Qualification Framework (NSQF) and by supporting the development of the Indian Labour Market Information System (LMIS). At the ground level the project experts work with the Indian partners on piloting Labour Market Analyses through enterprise surveys to determine the structure of the workforce, human resources management practices and training needs. Project experts and Indian partners also work on developing and testing examples of competence based curricula and on training the trainers and assessors.

One component of the Project has been tasked to enhance labour market and analyses at the national as well as the state/industrial cluster level. The intention is to build on what has already been achieved, to identify gaps and to support improvement. More specifically in regards to labour market information at the state/cluster level, it is planned to pilot new or amended methods of implementing a sector LMA, drawing on resources allocated by the Sector Skills Councils. These sector LMAs report on specific aspects of the labour market, and the outcomes can be used to target (quantitative and qualitative) labour market constraints and the development of new skill developing programmes or the update of existing ones.

1.2 The Capital Goods Skill Council

The Capital Goods Skill Council (CGSC) is responsible for the skills development for the capital goods sector in India. The CGSC is a not-for-profit organisation, registered under the Societies Registration Act, 1860. The Council has been promoted by the Federation of Indian Chambers of Commerce and Industry (FICCI) and by the Department of Heavy industries (DHI) and receives financial support by National Skill Development Corporation (NSDC).

The purpose of establishing CGSC is to ensure that the capital goods industry is able to grow with skilled manpower, as well as to increase its productivity and profitability.

The CGSC is expected to create a dynamic LMIS to keep track of the labour market skill gaps, to develop occupational standards, to facilitate the development of practical and high quality training content, and to ensure adequate availability of faculty through “Train The Trainer” initiatives. It will also build accreditation and certification mechanisms, and encourage capacity building through private sector participation.

To achieve the objective of creating a robust and vibrant eco-system for quality education and skill development in the capital goods sector, the CGSC has the mandate to:

- Identify skill development needs, including the preparation of a catalogue of types of skills, range and depth of skills to facilitate individuals to choose from them;
- Develop of a sector skill development plan and maintain a skill inventory;
- Determine skills/competency standards and qualifications.
- Standardise affiliation and accreditation processes;
- Participate in affiliation, accreditation, examination and certification;
- Plan and execute training of trainers;
- Promote academies of excellence;
- Establish a well-structured sector specific LMIS to assist the planning and delivery of training.

1.3 A labour market analysis of the sector

In line with the objectives of the project and of the CGSC, the following objectives have been set for the LMA:

- To test a methodology to collect primary data on human resources management practices, training needs and skills requirements for technical workers/employees,
- To better understand the skills demand and human resource management practices in the sector, and
- To collect information for the development of curricula for the job roles of CNC-Setter-cum-operator and Fitter-Fabrication.

In May and June 2015, the project and the Capital Goods Skill Council (CGSC) have implemented a labour market analysis in the state of Maharashtra. The findings of this study are presented in this technical report. The methodology has been evaluated in a “lessons learned” report, in order to highlight positive and practical learning that can be used for future, similar exercises.

2 Context of the study

2.1 The economy and labour market in Maharashtra

Maharashtra is the second largest state in India, both in terms of population and geographic area. According to the 2011 census the State has a population of approximately 11 crore, which is 9.3% of India's entire population. 45% of the population resides in urban areas, which also makes Maharashtra one of the most urbanised states in India.

The gross state domestic product (GSDP) at current prices for 2013-14 is estimated at 15 10 132 crores and contributes about 14.4% of the overall GDP of India. The GSDP has been growing rapidly over the last few years. At present industrial and service sectors together contribute approximately 87.1% of the State's income. The agriculture sector and related activities contribute the remaining 12.9% of the State's income.

The calculations of GSDP between 2004-05 and 2009-10 show high economic growth rates for Maharashtra in the last decade. Between 2004-05 and 2009-10, Maharashtra's economy grew at 11.1%, a faster rate than in comparative states and more than the all-India average of 9%.

Though agriculture contributes only 13% to the GSDP of Maharashtra, 64% of the labour force is active in this sector. Maharashtra, unlike other States, has only a small proportion of the share of employment in the industrial sector, amounting to just 14%. This is despite the fact that the industrial sector has a rather large contribution to the GSDP. In the service sector, the labour force is relatively small (22%) but contributes a large share of GSDP (64%), which points to high labour productivity in the sector.

The draft labour policy 2011 for Maharashtra highlights that a large number of workers operate in the unorganised sector. These include:

- Shops and establishments sector workers,
- Agricultural workers,
- Almost 2 000 000 domestic workers,
- Building and construction workers,
- Loading and unloading workers, and
- Almost 32 000 security guards.

In addition to these groups of unorganised sector workers, which have been mentioned in the Maharashtra labour policy, most other economic sectors also have a share of unorganised workers contributing in some way to the performance of the sector.

2.2 Specific features of the capital goods sector

Capital Goods sector comprises the production of plant and machinery, equipment /accessories required for manufacture / production, either directly or indirectly, of goods or for rendering services, including those required for replacement, modernization, technological up-gradation and expansion. It also includes packaging machinery and equipment, refrigeration equipment, power generating sets, equipment and instruments for testing, research and development, quality and pollution control.

The capital goods sector is crucial for the development of India's economy for the two reasons. Firstly, the capital goods sector is considered a strategic sector and the development of the necessary capabilities because the sector is essential from a national self-reliance and security perspective. Secondly, the capital goods sector has a direct effect on the growth of the user industries as it provides critical input, i.e., machinery and equipment, to the remaining sectors covered under the manufacturing activity. The capital goods industry contributes 12% to the total manufacturing activity (which is about 15% of the GDP).

With a view to achieve 9% growth in GDP during the 12th Five Year Plan, the manufacturing industry should grow at least by 11% to 13% per annum. This would mean that the Capital Goods sector, which is considered to be the core of manufacturing, should grow at around 17% to 19% (Department of Heavy Industry, 2011)).

Economic performance of the capital goods sector is linked with that of the manufacturing industry which is the key end-user of the Capital Goods industry. The capability to manufacture most of the major capital goods exists indigenously. However, given the superior technology competitiveness and competitive pricing of foreign players, the sector faces a stiff competition from imported machineries. The output of the sector is concentrated with a top few companies in most product groups, followed by a section of companies comprising medium to small scale players. Indian companies lack export thrust as the focus is largely on the domestic market. However, some of the larger players are exploring export market growth targeted especially towards the Middle East and Asian markets. The sector is expected to rely on government support in areas like export financing and promotion to tap vast global capital goods market opportunity (National Skill Development Corporation, 2012).

3 Methodology

For the Labour Market Analysis (LMA) Information from secondary and primary sources has been collected to understand the situation in the labour market for companies producing capital goods in the state of Maharashtra. Sources of secondary information were information portals of the government of India and the government of Maharashtra. Also, the CGSC has provided the consultants with reports on previous research in the sector and with the qualification profiles that have been developed for 56 job roles that are common in the sector. Of these 56 qualification profiles, 31 were final and 25 were under public view at the time of the implementation of the survey, and can still be changed. See the list of consulted documents on page 64 for more information.

Primary data has been collected during an enterprise survey in the Maharashtra in May and June 2015. Prior to and in parallel with the implementation of the survey, primary (qualitative) information has also been collected from representatives of the CGSC and from the project's expert in skills development for the capital goods sector, Mr Michael Wolf.

Findings based on secondary data and on (primary) information collected from the CGSC and the project's sector expert have been presented in the previous chapters. The collected primary information have been included in chapter 4.

3.1 Data collection methodology

For the collection of primary data for this study, the experts have developed three structured questionnaires for

1. Companies in the organised sector
2. Companies in the unorganised sector
3. Shop floor managers of CNC setter cum operators and fitters fabrication

The questionnaires have been discussed in detail with representatives of the CGSC. All questionnaires are included in Appendix 1.

The first questionnaire has been used most and has been designed to collect information from companies that are not part of the unorganised sector. It covers subjects like the occupational structure of companies, skills and training needs, common practices in recruitment and training, the economic situation in the sector and financial packages and benefits for workers in the most common job roles.

The second questionnaire is designed for companies in the unorganised sector. The National Commission for Enterprises in the Unorganised Sector (NCEUS) defines the unorganised or informal sector as:

"... all unincorporated private enterprises owned by individuals or households engaged in the sale and production of goods and services operated on a proprietary or partnership basis and with less than ten total workers".
(From: National Commission for Enterprises in the Unorganised Sector, 2008, page 3)

The questionnaire for the unorganised sector is similar to the questionnaire for the organised sector, but a number of questions have been removed because they are not so relevant for unorganised sector companies and because the interviewers have conducted the interviews without the help of a

paper version of the questionnaire (so as to not to scare off potential unorganised sector respondents) which is easier if the questionnaire is shorter.

The third questionnaire for shop floor managers that supervise CNC setters cum operator and/or fitters-fabrication contains specific questions about the number of workers in these job roles, skills and knowledge of recent school leavers and current workers in these job roles, and about equipment that is currently used in the company.

The questionnaires consist for the most part of closed questions, resulting in discrete quantitative information on a range of subjects. Yet the questionnaire also contained open questions, resulting in qualitative data that has been clustered in the final stages for analysis and presentation here.

A team of four, externally recruited, interviewers guided by labour market analysis experts of the project, collected the data directly from companies during face-to-face interviews with a company representative that is familiar with human resources management practices in the company, and with the shop floor manager supervising CNC setters cum operator and/or fitters-fabrication. The interviews to administer questionnaire 1 (and 2) took 45 minutes to 1 hour, and the interviews with the shop floor managers took about 20 minutes per job role (i.e. about 40 minutes for interviewees that supervised both CNC setters cum operators and fitters-fabrication).

3.2 Selection of companies for the enterprise survey

The identification of companies producing capital goods

There are about 25 types of Capital Goods generally included in the Chapters 84 and 85 of ITC (HS) Codes. A previous study (National Skill Development Corporation, 2012), covered 11 sectors i.e. Agricultural & Forestry Machinery, Earthmoving, Mining & Construction Machinery, Process & Plant Machinery, Light Engineering Goods, Machine Tools, Lifting & Handling Equipment, Plastic, Paper & Rubber Machinery, Power & Electrical Equipment, Textile Machinery, Dies, Moulds & Press tools and Tools & Gauges. However, the following sub-sectors currently represented in CGSC were covered in the survey in Maharashtra:

1. Process & Plant Machinery
2. Light Engineering
3. Machine Tools
4. Plastic Machinery
5. Power and electrical
6. Textile Machinery
7. Dies ,Moulds and Press Tools and Gauges

See Table 13 in Appendix 2 for a list of these sub-sectors and the codes for the economic activities in the National Industrial Classification (All Economic Activities) 2008.

Different approaches have been chosen for the selection of companies for the survey. For companies in the organised sector, assistance from CGSC member associations was taken to firm up a list of companies, consisting of the following 450 companies:

- 169 members of the Indian Machine Tool Manufacturers' Association (IMTMA)
- 187 members of the Tool And Gauge Manufacturers Association (TAGMA) of India
- 94 members of the Process Plant & Machinery Industry Association of India (PPMAI)
- 57 other companies

These 450 companies were distributed over five divisions in Maharashtra, i.e. 272 in Mumbai, 151 in Pune, 14 in Aurangabad, 11 in Nashik and 2 in Nagpur.

Due to the nature of the unorganised sector, no register of unorganised sector companies was available to draw a sample from. That is why companies of the organised sector that took part in the survey were requested to help identify companies of the unorganised sector.

The response

As the response from organised sector companies to the request to participate in the survey was low, hence instead of using stratified sampling based on division, all companies on the list (except for two companies in Nagpur) were contacted and asked to participate in the survey. A total of 67 companies agreed to participate (leading to a response rate of 15%).

Due to this limited response, the non-probability (i.e. not random) method of “snowball sampling” or “referral sampling” was adopted. Company representatives and local industry associations with a network in the capital goods sector were requested to help identify other (organised or unorganised sector) companies in the sector and to assist in making appointments, and the interviewers were able to include additional companies from their personal networks as well. Together, these efforts resulted in 38 additional companies taking part in the survey.

The response varied from division to division. The help of the local representative in Aurangabad had a very positive effect on the response rate (see Table 1). And the help of the local representative in Nashik resulted in 7 additional companies, while the number of companies on the list suggested that there were only 11 companies in this division. The experience in these two divisions illustrates one of the lessons learned, i.e. that the request to participate in a survey should come from someone or from an organisation that is known and trusted by the target group.

Table 1 - Response by division and number of additional participants through recommendation

Division	Number of companies:		Positive response		Additional participants	Total participants
	in the CGSC list	asked to participation	number	in %		
Total	450	448	67	15%	38	105
Aurangabad (HQ Aurangabad)	14	14	8	57%	3	11
Konkan division (HQ Mumbai)	272	272	19	7%	14	33
Nagpur division (HQ Nagpur)	2	0	N.A.	N.A.	N.A.	N.A.
Nashik division (HQ Nashik)	11	11	1	9%	7	8
Pune division (HQ Pune)	151	151	39	26%	14	53

In the enterprise survey in the automotive industry in Maharashtra (India-EU Skills Development Project, 2013), the identification of unorganised sector companies was relatively easy, but in the current survey, the number of companies in the unorganised sector was much lower than the experts had expected. Of the 67 companies, one of the participating companies on list of organised sector companies had less than 10 employees and was hence regarded as an unorganised sector company. Out of the additional 38 companies that were identified, only 8 companies were part of the unorganised sector, which means that out of the 105 participating companies, 9 are part of the unorganised sector. Considering the impressive size of the unorganised sector in India, the experts feel that the chosen approach to identify unorganised sector companies was not suitable. Hence, it is recommended to conduct further research to establish the share of unorganised sector companies in the sector as well as their distribution over the different sub-sectors.

3.3 Data analysis

The interviewers noted the information on the paper questionnaires during the interviews or, in the case of unorganised sector companies, immediately after the interview. At the end of the day, they entered the data in the online questionnaires programmed on the Qualtrics software platform (see www.qualtrics.com). In these online questionnaires, potential mistakes and problems were taken into account as much as possible. Regular Microsoft software for spreadsheets and databases was used to clean the data of any remaining mistakes.

The first steps of the analysis involved the clustering and categorisation of the answers to open questions, the recoding of the sub-sectors based on the description of the activities in the company and the coding of the job roles. The table in Appendix 3 holds the categorisation of companies in different sub-sectors: for the companies that were not in the CGSC list, the sub-sector has been chosen based on the description of the companies' activities as given by the interviewers. If necessary, the experts have studied web-sites and promotion materials the interviewers received during the interview. For 35 companies on the CGSC list, the sub-sector given on the list has remained the same, while the sub-sector for 32 other companies has been changed according to the description of the interviewers.

The 105 respondents have mentioned 584 job roles being present in their companies. As similar job roles can go by different names (for example, fitters-fabrication are likely to do the same work as fabrication-welders or fitters-welders, etc.), the 584 job roles have been coded into 46 job role names. Coding has been based on the descriptions given by the respondents and as much as possible in line with the National Occupational Standards/Qualification Packs (NOS/QPs) that the CGSC has developed / is currently developing (see www.cgsc.in/qualification_pack.html for more information). It was not always possible to code the job roles in line with the NOS/QPs, sometimes because the job roles were not specific for the capital goods sector (like administrative roles or managers) and sometimes because (especially micro-sized and small companies tend to) have more generalist job roles, while the NOS/QPs are developed for highly specialised job roles².

As 46 job role names give too much detail for an analysis of the workforce in the participating 105 companies, the job role names have been merged into 20 job map developed by CGSC (Consultants Prodigence & GlobalPeers, 2014). See Appendix 4 for detailed role categories, using the occupational information on the job role names, job role categories and the description given by the respondents.

3.4 Limitations of the study

The study was designed to address the objectives described in Chapter 1. The findings of the study can also be useful for other purposes, but whoever wants to use the information should keep the following in mind:

- Due to limited time and limited participation, the selection method had to be amended as described above. This means that the findings cannot be generalised for the entire capital goods sector in Maharashtra.
- Since this was the first time ever enterprise survey to collect information about the skills in the capital goods sector in Maharashtra, the outcomes cannot be compared to previous

² One example of a more general job role is the role of helpers. For this job role, no qualification pack has been developed because Governing Council of the CGSC has decided to reduce the use of helpers on the shop floor across all companies.

results. However, the outcomes can be used as a baseline for similar future studies in Maharashtra or elsewhere.

- The focus of the study was on assessing the occupational structure, human resources management practices and skill needs in the capital goods industry, as well as on the collection of information for the development of curricula for CNC-Setter-cum-operator and Fitter-Fabrication. The findings and conclusions are more of a qualitative nature, useful for initiatives to improve or strengthen training of employees or future employees, rather than forecasting numbers.
- The quality of the findings of any survey depends on the ability of the respondents to understand questions and give answers that truly reflects their views or circumstances. Also, it is possible that respondents answer strategically rather than truthfully, for example because their perception and understanding of the parties involved in the survey and of the way the data will be used. Of course, these factors have been taken into account when developing the questionnaires and while implementing the survey, but an effect on the findings of the survey cannot be ruled out.
- This survey on labour market demand has not been complemented with a similar exercise on labour market supply. Also, the findings have not been discussed with a “focus group” consisting of key sector stakeholders. This will be taken as learnings for the next such survey.

Through careful analysis of the results, while taking the limitations into account, the findings of the survey have helped in describing the current situation in the participating capital goods companies in Maharashtra. See Chapter 4 for more information.

4 Findings

4.1 Characteristics of the participating companies

Table 2 illustrates some selected characteristics of the companies participating in the survey. It shows that the group of 105 companies operate in different sub-sectors, are based in different divisions, and have different sizes and forms of ownership. Almost one in ten companies is part of the unorganised sector, but the overall majority is part of the organised sector.

Sub-sector

Looking at the table in more detail, it is clear that the participating company mostly operate in two sub-sectors, i.e. in Machine tools and Dies, moulds and press tools. One in ten produces light engineering goods and the remaining companies produce process plant equipment, tools and gauges, power & electrical equipment, textile machinery and material handling and lifting equipment. To facilitate the analysis, the variables organised/unorganised sector and sub-sector have been merged into another sub-sector variable, showing that Machine tools and Dies, moulds and press tools are the biggest with a share of 36% and 26% respectively. Light engineer goods remains a separate category with 9% and the two new categories are other capital Goods and unorganised sector companies.

Table 2 - Characteristics of participating companies

Company characteristics	Number of companies	Share in total (in %)	Company characteristics	Number of companies	Share in total (in %)
Total	105	100%	Total	105	100%
Organised / unorganised sector			Location		
Organised sector	96	91%	an urban area	98	93%
Unorganised sector	9	9%	a rural area	7	7%
Subsector			Type of ownership		
Dies, Moulds & Press tools	31	30%	Sole proprietorship (owned by one person)	15	14%
Light Engineering Goods	11	10%	Partnership (owned by two or more people)	22	21%
Machine Tools	41	39%	Public corporation	7	7%
Material Handling and Lifting Equipment	1	1%	Private corporation	51	49%
Power & Electrical equipment	5	5%	Not asked (unorganised sector) / unknown	10	10%
Process Plant Equipment	7	7%	Company Size - investment		
Textile Machinery	3	3%	Micro (investment less than Rs 25 Lakh)	1	1%
Tools & Gauges	6	6%	Small (investment Rs. 25 lakh to Rs. 5 crore)	30	29%
Sub-sector (merged)			Medium (investment Rs.5 crore to Rs.10 crore)	31	30%
Dies, Moulds & Press Tools	27	26%	Large (investment more than Rs. 10 crore)	33	31%
Light Engineering Goods	9	9%	Not asked (unorganised sector) / unknown	10	10%
Machine Tools	38	36%	Company size - number of workers ^{*)}		
Other capital Goods	22	21%	Up to 9 workers	9	9%
Unorganised sector	9	9%	10 to 49 workers	43	41%
Division			50 to 249 workers	39	37%
Pune division (HQ Pune)	53	50%	250 workers or more	14	13%
Konkan division (HQ Mumbai)	33	31%			
Aurangabad (HQ Aurangabad)	11	10%			
Nashik division (HQ Nashik)	8	8%			

^{*)}Number of workers is the sum of permanent employees, temporary employees, contract workers and trainees

Location

Half of the companies were based in Pune, almost a third in Mumbai, and 10% and 8% were based in Aurangabad and Nashik respectively. Compared with the number of companies on the CGSC list (see Table 1), this means that the companies in Aurangabad and Nashik are over-represented, which is

probably the result of the help of the local representatives of the company associations in making appointments for the interviews. The overall majority is based in urban areas.

Ownership

Almost half of the companies are private corporations (whose shareholders cannot sell/buy shares on a stock exchange), while about one in three companies are owned by one owner or by a partnership of two or more people. Very few of the organised sector participating companies are public corporations (i.e. a company owned by shareholders that can sell/buy shares on a stock exchange).

Company size

In terms of investment, all company sizes are present among the participating companies, except for micro-sized companies. This could be explained by the nature of the sector (i.e. production requiring relatively expensive machinery), but it is also possible that an under-representation of unorganised sector companies results in the under-representation of micro-sized companies, i.e. an investment of up to INR 25 lakh. The share of small, medium and large companies is more or less the same among the participating companies. Unorganised sector companies have not been asked about investments and some organised sector companies did not feel comfortable to answer this question.

Another way to define company size is by looking at the number of persons working with the company. Through the questionnaire for the organised sector, the companies were asked about the number of permanent employees, the number of temporary employees, workers employed via a contractor, trainees and the number of vacancies. The company size according to the number of persons working with the company has been categorised based according to the total number of persons that work with the company as a permanent employee, temporary employee, contract worker or trainee. Companies in the unorganised sector were asked only about the number of employees.

The majority of the organised sector companies had up to 250 workers: 41% had 10 to 49 workers and 37% had 50 to 249 employees. Only 14 companies had more than 250 persons and 9 companies, that are part of the unorganised sector, had 9 employees or less.

Comparing the different variables for company size shows that the relation between the number of workers and investment in the company is not straightforward. There is only one micro-sized company (in terms of investment) in the group of participants, while there are 9 companies with 9 employees or less. Similarly, large sized companies (with an investment of more than 10 crore) do not necessarily employ 250 employees or more. See Table 14 in Appendix 2 for a break down of companies by company size (both in terms of investment and in terms of number of workers) and sub-sector.

4.2 Composition of the workforce

Number of workers

Table 3 holds more detailed information about the workforce in the capital goods sector as a whole and in the different sub-sectors. The figure shows that all companies had permanent employees, but that other categories of workers were not present in all of the participating companies: half of the companies had trainees and about a similar share offered employment to contract workers. Only 14% temporary employees and 6% casual workers were reported. . Four out of every ten companies (42%) reported vacancies – on average 6.5 per company, which is about 1% of the total number of workers.

Table 3 - Number of workers by category and sub-sector

Sub-sectors and categories of workers	Valid answers (companies)		Number of persons in category			Share in total workers (in%)
	number	% of total	Minimum	Maximum	Average	
Total						
Permanent employees	105	100%	4	3500	152,8	69%
Temporary employees	15	14%	1	2000	160,9	10%
Contract workers	55	52%	1	522	63,9	15%
Trainees	54	51%	1	400	20,4	5%
Vacancies	44	42%	1	40	6,5	1%
Casual workers	6	6%	2	15	4,7	0%
Total employees *)	105	100%	4	5500	175,8	80%
Total workers *)	105	100%	4	5956	220,0	100%
Total employment *)	105	100%	4	5956	222,7	101%
Number of women	69	66%	1	240	13,5	4%
Number of disabled persons	14	13%	1	8	2,4	0%
Dies, Moulds & Press Tools						
Permanent employees	27	100%	8	211	55,6	63%
Temporary employees	4	15%	2	36	16,5	3%
Contract workers	14	52%	6	160	41,8	25%
Trainees	15	56%	2	120	15,5	10%
Vacancies	14	52%	2	20	6,4	4%
Casual workers						
Total employees *)	27	100%	8	211	58,1	66%
Total workers *)	27	100%	11	371	88,4	100%
Total employment *)	27	100%	14	371	91,7	104%
Number of women	16	59%	1	19	5,3	4%
Number of disabled persons	3	11%	1	3	2,0	0%
Light Engineering Goods						
Permanent employees	9	100%	13	1200	214,7	69%
Temporary employees	2	22%	1	14	7,5	1%
Contract workers	3	33%	6	400	137,7	15%
Trainees	5	56%	2	400	91,4	16%
Vacancies	5	56%	1	16	7,2	1%
Casual workers	1	11%	2	2	2,0	0%
Total employees *)	9	100%	14	1200	216,3	69%
Total workers *)	9	100%	17	1600	313,2	100%
Total employment *)	9	100%	17	1600	317,2	101%
Number of women	7	78%	1	40	10,0	2%
Number of disabled persons	3	33%	1	8	4,3	0%
Machine Tools						
Permanent employees	38	100%	6	3500	180,4	68%
Temporary employees	6	16%	2	2000	340,3	20%
Contract workers	22	58%	1	456	45,9	10%
Trainees	21	55%	1	50	10,5	2%
Vacancies	17	45%	2	40	6,7	1%
Casual workers						
Total employees *)	38	100%	6	5500	234,1	88%
Total workers *)	38	100%	11	5956	266,5	100%
Total employment *)	38	100%	16	5956	269,5	101%
Number of women	29	76%	1	90	12,2	4%
Number of disabled persons	5	13%	1	5	1,8	0%
Other capital Goods						
Permanent employees	22	100%	5	3500	259,0	74%
Temporary employees	3	8%	4	278	96,7	4%
Contract workers	16	42%	7	522	94,3	20%
Trainees	13	34%	2	69	14,8	3%
Vacancies	6	16%	2	25	6,8	1%
Casual workers	4	11%	3	15	6,0	0%
Total employees *)	22	58%	5	3778	272,1	78%
Total workers *)	22	58%	20	4369	350,5	100%
Total employment *)	22	58%	23	4369	352,4	101%
Number of women	16	42%	1	240	26,2	5%
Number of disabled persons	3	8%	1	2	1,7	0%
Unorganised sector **)						
Employees	9	100%	4	9	6,3	100%
Vacancies	2	22%	2	2	2,0	7%
Casual workers	1	11%	2	2	2,0	4%
Total employees / workers	9	100%	4	9	6,3	100%
Total employment *)	9	100%	4	9	7,0	111%
Number of women	1	11%	1	1	1,0	2%
Number of disabled persons						

*) The following definitions are used in this report:

Total employees: the total number of permanent employees and temporary employees.

Total workers: total employees plus the number of contract workers and the number of trainees

Total employment: total workers plus total vacancies

***) Unorganised sector companies were asked for the total number of employees, vacancies and casual workers in the last months. They also mentioned the number of women and the number of workers with a disability

On average, the total number of persons directly employed by the companies (on a permanent or temporary basis) was 176. Together with the number of contract workers, trainees and casual workers, the average number of people working with companies in the capital goods sector was 220. Keeping in view the average number of 6.5 vacancies in the companies, the average number of positions in the company would be 223.

Almost 70% of the workers (153 out of 220) were permanent employees. The remaining work was done by contract workers (12%) and temporary employees (10%), and to a lesser extent by trainees (5%). Only 1% of the positions were vacant at the time of the interview and hardly any work was done by casual labourers.

Though two-thirds of the companies indicated that women were employed, the reported share of women in the workforce was 4%. Only 13% of the companies had employed differently abled persons, but the share of this group in the labour force was negligible. The reported share of women and differently abled persons was more or less the same in all sub-sectors.

The average number of workers per company differed between the sub-sectors. Companies producing dies, moulds and press tools had relatively fewer workers compared to the other sub-sectors: while the overall average number of workers was 220, the average number of workers in companies producing dies, moulds and press tools was 88. Also, the share of (permanent and temporary) employees was smaller than average (66% versus 80%) in this sector, which was compensated by a higher share of contract workers and trainees. Lastly, the dies, moulds and press tools sub-sector had a relatively high share of vacancies, i.e. 4% compared to 1% on average.

The workforce of the biggest sub-sector Machine tools in this survey was bigger than average: on average a company producing machine tools had 267 workers. The number of permanent employees was about average, but a bigger than average share (20%) consisted of temporary employees while the number of contract workers and trainees was much lower than average. Though 45% of the companies reported vacancies, the number of vacancies was relatively low.

Participating companies that produce light engineering goods were a bit bigger than average. As only 9 companies from this sub-sector took part in the survey, no conclusions could be drawn about the distribution of workers over different categories. However, the figures suggest that, though 5 out of 9 companies reported vacancies, the share of vacancies in the total workforce was relatively low.

Companies producing other capital goods had the largest average workforce and offered work to a comparatively large number of permanent employees and contract workers. They employed a relatively small share of temporary employees and trainees. Only 16% of these companies reported vacancies, which is very little compared to the average of 42% companies reporting vacancies during the survey.

Due to its definition, the number of workers in the participating unorganised sector companies was low, i.e. 6 persons on average. The number of vacancies and casual workers seemed higher than average, but this is based on the answers of only 2 and 1 companies respectively, which is not sufficient to support this conclusion.

The number of workers in different categories by division is presented in Table 15 in Appendix 2. The table shows that relatively many companies in Pune had trainees and vacancies and that a fairly large share of these companies employed women. However, the share of trainees and women in the workforce did not deviate much from the other companies and the number of vacancies was also not higher than average, which means that the numbers of trainees, vacancies and women in the

companies was small. Companies based in Mumbai had fewer (permanent and temporary) employees and many Mumbai-based companies worked with staff provided by contractors. Very few companies reported having vacancies and not so many companies had trainees. However, companies that had vacancies and worked with trainees had a relatively high number of them. The number of participating companies in Aurangabad and Nashik was small. These companies seemed to have relatively few temporary employees and contract workers, which was compensated by a higher share of trainees in the workforce.

Table 16 in Appendix 2 holds information about the number of workers in different categories by company size in terms of investment. It shows that the share of permanent employees was high in all company sizes, varying from 68% to 75% of the total number of workers. The number of temporary employees in small and medium-sized companies was much lower than in large companies. On the other hand, small companies worked more often with contractors, which resulted in a relatively high share of contract workers in small companies. Also, small companies were more likely to have vacancies than larger companies and the number of vacancies per company was also higher than average.

Comparatively many medium sized companies had temporary employees, but the average number of temporary per company was not so big. The lower share of temporary employees in the work force was compensated by a higher share of permanent employees and trainees. Large companies stand out because a large majority of the companies (79%) worked with contractors.

Table 17 in Appendix 2 contains information of the different categories of workers by company size in terms of workers. The information in this table is more or less in line with the findings mentioned above: small companies had a relatively low share of temporary employees in the workforce, which was compensated by a higher share of permanent employees and contract workers. Also, more small companies reported vacancies and the number of vacancies was relatively high. Medium sized companies also reported a lower share of temporary employees than bigger companies, which was compensated by a higher share of permanent employees and trainees. Fewer medium sized companies reported vacancies than large companies, but the number of vacancies per company is higher. The overall majority of companies employing 250 workers or more worked with contractors (93%) and had trainees in the company (79%). Relatively few large companies reported vacancies.

Table 16 and Table 17 show that the more employees companies had, the more likely they were to hire women. Nevertheless, the share of women in the work force was higher in medium sized and small companies. As mentioned before, the share of differently abled workers in the work force was negligible in all categories of companies, i.e. there was no difference between sub-sectors, divisions or company sizes.

Most common job roles

As mentioned in the methodology chapter, the participating companies mentioned 584 job role titles, which have been recoded to 46 job role names and 20 broader job role categories. Table 4 contains the breakdown of the job roles mentioned by different job role categories and by company size, while these figures are presented by sub-sector in Table 5.

Table 4 - Job roles mentioned by job role category and distribution by company size (in terms of workers)

Job role category	Job roles mentioned	Distribution over job role category by company size				
		Total	Up to 9 workers	10 to 49 workers	50 to 249 workers	250 workers or more
Total job roles mentioned	584	584	27	220	236	101
Average number job roles mentioned per company	5,6	5,6	3,0	5,1	6,1	7,2
Design roles:	110	19%	7%	19%	23%	12%
CNC Programmer	32	5%	4%	5%	7%	2%
Designer / draughtsman	78	13%	4%	13%	16%	10%
Machinist roles:	136	23%	30%	28%	19%	21%
CNC operator	40	7%		10%	6%	6%
CNC setter cum Operator	17	3%	4%	2%	3%	4%
Conventional machine operator	63	11%	26%	13%	7%	11%
Operator and/or setter (EDM)	16	3%		4%	3%	
Production Roles	149	26%	22%	22%	28%	30%
Assembly - Fitter – Electrical & electronic	30	5%	11%	4%	6%	5%
Assembly - Fitter – Mechanical / Maintenance	29	5%		5%	5%	6%
Assembly - Tool and Die Maker	14	2%	4%	3%	1%	4%
Component Fabrication and Preparation	13	2%		2%	1%	6%
Component Fabrication and Preparation - Fabrication Fitter	19	3%	7%	2%	4%	4%
Quality, Managerial and Supervisory roles	44	8%		6%	11%	5%
Welding and Related Roles	18	3%	4%	2%	2%	8%
Painting and Coating Roles	7	1%		2%	1%	
Quality Roles	17	3%		4%	3%	2%
Helper	41	7%	19%	9%	6%	4%
Projects and Planning Roles	70	12%	4%	11%	12%	16%
Marketing, Research and Service Roles	18	3%		2%	4%	4%
Administrative Roles	11	2%	15%	1%	1%	1%
Other (production) Roles	7	1%		0%	1%	3%

Table 5 - Job roles mentioned by job role category and distribution by sub-sector

Total job roles mentioned	Total job roles mentioned	Distribution over job role category by sub-sector					
		Total	Dies, Moulds & Press Tools	Light Engineering Goods	Machine Tools	Other Capital Goods	Unorganised sector
Total job roles mentioned	584	584	158	60	216	123	27
Average number job roles mentioned per company	5,6	5,6	5,9	6,7	5,7	5,6	3,0
Design roles:							
CNC Programmer	32	5%	9%		6%	3%	4%
Designer / draughtsman	78	13%	15%	13%	15%	11%	4%
Machinist roles:							
CNC operator	40	7%	11%	8%	6%	4%	
CNC setter cum Operator	17	3%	3%		5%		4%
Conventional machine operator	63	11%	11%	10%	13%	4%	26%
Operator and/or setter (EDM)	16	3%	6%	3%	2%	1%	
Production Roles							
Assembly - Fitter – Electrical & electronic	30	5%	3%	3%	6%	7%	11%
Assembly - Fitter – Mechanical / Maintenance	29	5%	4%	10%	6%	3%	
Assembly - Tool and Die Maker	14	2%	6%	5%			4%
Component Fabrication and Preparation	13	2%	1%	8%	1%	3%	
Component Fabrication and Preparation - Fabrication Fitter	19	3%	1%	2%	3%	7%	7%
Quality, Managerial and Supervisory roles	44	8%	9%	3%	6%	11%	
Welding and Related Roles	18	3%		3%	2%	8%	4%
Painting and Coating Roles	7	1%	1%		2%	1%	
Quality Roles	17	3%	1%	3%	4%	5%	
Helper	41	7%	8%	3%	6%	7%	19%
Projects and Planning Roles	70	12%	8%	18%	11%	18%	4%
Marketing, Research and Service Roles	18	3%	1%	2%	5%	4%	
Administrative Roles	11	2%	1%	3%	0%	2%	15%
Other (production) Roles	7	1%	1%		1%	2%	

Companies mentioned on average 5,6 common job roles. Table 4 shows that the average number of job roles per company corresponded with the company size in terms of number of workers, which makes sense as big companies are more likely to have relatively specialised positions while workers in smaller companies will need to do these tasks with a smaller number of people, leading to more generalist positions. Table 5 shows that the companies producing light engineering goods mentioned the largest number of job roles, i.e. 6.7 job roles on average. With 5.9 most common job roles per company, positions in companies producing dies, moulds and press tools are also a bit more specialised than in other companies.

Of course the nature of the most common job roles is more interesting than the number of most common job roles per company. The distribution of the job role categories in the two middle size categories -i.e. small companies with 10 to 49 workers and medium sized companies with 50 to 249 workers- is more or less similar, though the share of small companies mentioning CNC operators as a common job role is relatively high and a higher than average number of small companies mentioned having conventional machine operators on the work floor (see Table 4). Relatively many medium sized companies indicated having design roles, and quality, managerial and supervisory roles, but relatively few participants mentioned having conventional machine operators. Lastly, large companies (with 250 employees or more) mentioned projects and planning roles and job roles related to welding as common job roles more often than the other companies. Design roles are more common in small and medium-sized companies than in micro-sized and large companies.

Analysis of the data shows that companies producing dies, moulds and press tools mentioned design roles, machinist roles (i.e. CNC operators and operator and/or setter (EDM)), and tool and die makers more often than other companies. Companies producing light engineering goods also mentioned tool and die makers more than average and reported more machinist roles, design roles and projects and planning roles as well. Machine tools producing companies did not deviate from the total distribution of job roles very much, but mentioned relatively often CNC setters cum operators and marketing, research and service roles. Companies producing other capital good mentioned common job roles such as component fabrication and preparation (including fabrication fitters), welding and related job roles, and quality roles, but relatively few machinist roles. A relatively big share of the job roles mentioned by unorganised sector companies are directly related to production, i.e. machinist roles (especially conventional machine operators), production roles (excluding the quality, managerial and supervisory roles) and helpers. Helpers are also mentioned by organised sector companies, but the number of helpers seems to decrease if the company size increases.

In Table 18 in Appendix 2, job role categories and names are broken down by the associated qualification level mentioned by the interviewees. The table makes clear that the associated education level of machinist, production, and welding and related roles, was generally class 8 to 12 and (ITI or CGSC) certificate level. Design, quality, project and planning, marketing, research and service roles are associated mostly with degree level and to a lesser extend with diploma level.

The number of workers per job role category is presented by sub-sector in Table 6. It shows that six job role categories account for more than eight thousand (i.e. two thirds of the) workers in the most common job roles in the participating companies. These job role categories are:

- Design Roles - Designer / draughtsman - 1.433 workers (12%)
- Machinist Roles - CNC operator - 1.323 workers (11%)
- Machinist Roles - Conventional machine operator - 1.063 workers (9%)
- Production Roles - Assembly - Fitter – Mechanical / Maintenance - 1.039 workers (8%)
- Welding and Related Roles - 1.093 workers (9%)

- Projects and Planning Roles - 2.204 workers (18%)

Table 6 - Number of workers per job role category by sub-sector

Job role category	Total	Number of workers distribution over job role *) categories				
		Dies, Moulds & Press Tools	Light Engineering Goods	Machine Tools	Other Capital Goods	Unorganised sector
Total	12.356	1.717	1.890	5.626	3.070	53
Design roles:						
CNC Programmer	1%	3%		1%	1%	2%
Designer / draughtsman	12%	13%	2%	13%	14%	2%
Machinist roles:						
CNC operator	11%	13%	9%	15%	3%	
CNC setter cum Operator	5%	3%		11%		6%
Conventional machine operator	9%	18%	5%	10%	2%	34%
Operator and/or setter (EDM)	2%	12%	0%	1%	0%	
Production Roles:						
Assembly - Fitter – Electrical & electronic	3%	1%	2%	4%	4%	6%
Assembly - Fitter – Mechanical / Maintenance	8%	8%	5%	14%	1%	
Assembly - Tool and Die Maker	2%	7%	4%			9%
Component Fabrication and Preparation	2%	1%	7%	1%	1%	
Component Fabrication and Preparation - Fabrication Fitter	5%	3%	0%	2%	15%	4%
Quality, Managerial and Supervisory roles	2%	4%	0%	2%	3%	
Welding and Related Roles	9%		1%	6%	25%	2%
Painting and Coating Roles	0%	0%		1%	0%	
Quality Roles	1%	0%	1%	1%	1%	
Helper	4%	4%	1%	3%	7%	25%
Projects and Planning Roles	18%	3%	61%	12%	11%	2%
Marketing, Research and Service Roles	3%	1%	0%	4%	4%	
Administrative Roles	1%	0%	0%	0%	5%	9%
Other (production) Roles	2%	7%		0%	3%	

¹⁾ Number of workers is the total of permanent employees, temporary employees, contract workers and trainees

There were significant differences in the composition of the workforce in the different sub-sectors. For example, in the unorganised sector, the smallest sub-sector in this survey, only two job role categories stood out, i.e. conventional machine operators and helpers. In contrast, in the biggest sub-sector in this survey, Machine Tools, the number of workers in four to six different job role categories was substantially higher than in others. These were CNC operators, fitters – mechanical / maintenance, designers / draughtsmen, and projects and planning roles. Also important in this sub-sector were CNC setters cum operators and conventional machine operators. In companies producing dies, moulds and press tools, the most common job role category was conventional machine operating roles, followed by designers / draughtsmen, CNC operators and operators and/or setters of electro discharge machines. An (unlikely) big share of the work force in the sub-sector Light Engineering Goods consisted of persons in project and planning roles and companies also employed a relatively big number of workers in CNC operators and component fabrication and preparation job roles. Major job role categories in companies producing other capital goods were welding and related roles followed by fabrication fitters, designers / draughtsmen and projects and planning roles.

Table 7 contains information about the distribution of different worker categories over the different job role categories. It shows that the distribution of permanent employees over the different job role categories was more or less the same as the average distribution, most likely because it was the biggest group in the total number of workers. However, this was not the case for all job role categories. The table shows that almost six out of ten temporary employees were welder or had related positions and one in five temporary employees worked as fabrication fitters. Less likely positions for temporary employees were project planning roles and fitter mechanical / maintenance.

Contract workers were unlikely to work in project planning roles and as designer / draughtsmen, but the share of contract workers in the job role categories conventional machine operators and helpers was higher than in other job role categories. Almost six out of ten trainees were employed in a project planning role.

The number of vacancies for CNC operators and project and planning roles was relatively high compared to the number of workers in these job role categories. The number of vacancies for welders and related roles and for fitter – mechanical / maintenance was relatively low.

Not many women worked in the most common job roles. The ones that did, were mostly employed as designers / draughtsmen, in projects and planning roles and in other (production) roles. Women that were directly involved in the production process worked mostly as CNC setter cum operator.

Table 7 - Number of workers in different categories of workers by job role category

Job role category	Number of workers distribution over job role ¹⁾ categories					Number of vacancies	Number of women
	Total workers	Permanent employees	Temporary employees	Contract workers	Trainees		
Total	12.356	9391	362	1719	884	186	190
Design roles:							
CNC Programmer	1%	1%	1%	2%	2%	4%	
Designer / draughtsman	12%	14%	3%	3%	8%	12%	19%
Machinist roles:							
CNC operator	11%	13%	4%	3%	6%	24%	3%
CNC setter cum Operator	5%	6%		4%	0%		9%
Conventional machine operator	9%	8%	3%	16%	5%	10%	1%
Operator and/or setter (EDM)	2%	2%		1%	4%		
Production Roles							
Assembly - Fitter – Electrical & electronic	3%	3%	1%	5%	2%	2%	5%
Assembly - Fitter – Mechanical / Maintenance	8%	9%	0%	8%	1%	2%	8%
Assembly - Tool and Die Maker	2%	1%		3%	1%	8%	3%
Component Fabrication and Preparation	2%	1%	1%	5%	0%	2%	1%
Component Fabrication and Preparation - Fabrication Fitter	5%	4%	22%	8%	3%	2%	
Quality, Managerial and Supervisory roles	2%	3%		2%	1%	2%	6%
Welding and Related Roles	9%	7%	59%	13%	4%		
Painting and Coating Roles	0%	0%	1%	0%		1%	1%
Quality Roles	1%	1%				1%	
Helper	4%	1%	2%	18%			1%
Projects and Planning Roles	18%	18%	1%	1%	58%	27%	27%
Marketing, Research and Service Roles	3%	4%		1%	3%	3%	5%
Administrative Roles	1%	2%	2%				3%
Other (production) Roles	2%	1%		6%	2%	1%	8%

¹⁾ Number of workers is the total of permanent employees, temporary employees, contract workers and trainees

4.3 Employee turnover and recruitment & selection of new employees

Employee turnover and recruitment problems

A quarter of the companies reported that the turnover of workers in the current year was higher than in the previous year, while 3 out of 10 reported that the employee turnover was lower (see Table 8). Companies reporting a higher employee turnover than last year had fewer workers than the other companies, i.e. 78.5 on average, while companies reporting that the employee turnover was the same as the year before have more employees, i.e. 307 employees on average. Companies reporting a higher turnover this year have more vacancies than other companies.

A challenge faced by smaller companies is that employees prefer to work with larger companies and leave as soon as the opportunity arises. This could be one of the reasons for a higher employee turnover in smaller companies.

Table 8 - Employee turnover compared to last year by sector, division, average number of workers and vacancies

Sector / Division	Total (N)	Turnover compared to last year (in % of total):			
		higher	the same	lower	No answer
Total	105	25%	42%	30%	3%
Sector					
Dies, Moulds & Press Tools	27	15%	48%	33%	4%
Light Engineering Goods	9	22%	33%	44%	
Machine Tools	38	34%	47%	16%	3%
Other capital Goods	22	23%	32%	41%	5%
Unorganised sector	9	22%	33%	44%	
Division					
Pune division (HQ Pune)	53	19%	58%	21%	2%
Konkan division (HQ Mumbai)	33	33%	18%	45%	3%
Aurangabad (HQ Aurangabad)	11	36%	18%	36%	9%
Nashik division (HQ Nashik)	8	13%	63%	25%	
Average number of workers ^{*)}	220,0	78,5	306,9	224,9	119,3
Average number of vacancies	2,7	3,7	3,5	1,0	0,7

^{*)} Total number of workers is the sum of (permanent and temporary) employees, contract workers, trainees and casual workers

Two out of five companies (40%) reported that the turnover was higher for the staff in one or more of the most common job roles than in other job roles, and almost 6 out of 10 (58%) reported recruitment problems for one or more of the most important job roles.

On average, a higher turnover was reported for 11% of the most common job roles and for 22% of the most common job roles recruitment problems were reported. In Table 9, the figures are broken down by job role category. Skills problems were reported for 10% of the most common job roles.

The table shows that most problems are reported for CNC operator job roles. The participating companies mentioned that there is a higher turnover, more recruitment problems and more skill problems for CNC operators than for other job roles. This can probably partly be explained by the fact that CNC operators are one of the biggest categories of the most common job roles (see Table 6). More than average recruitment problems were reported for job role categories like tool and die makers, conventional machine operators, welding and related roles and for marketing, research and service roles.

Unfortunately, the nature of skill problems was specified by only a limited number of companies. See Table 20 in Appendix 2 for more information.

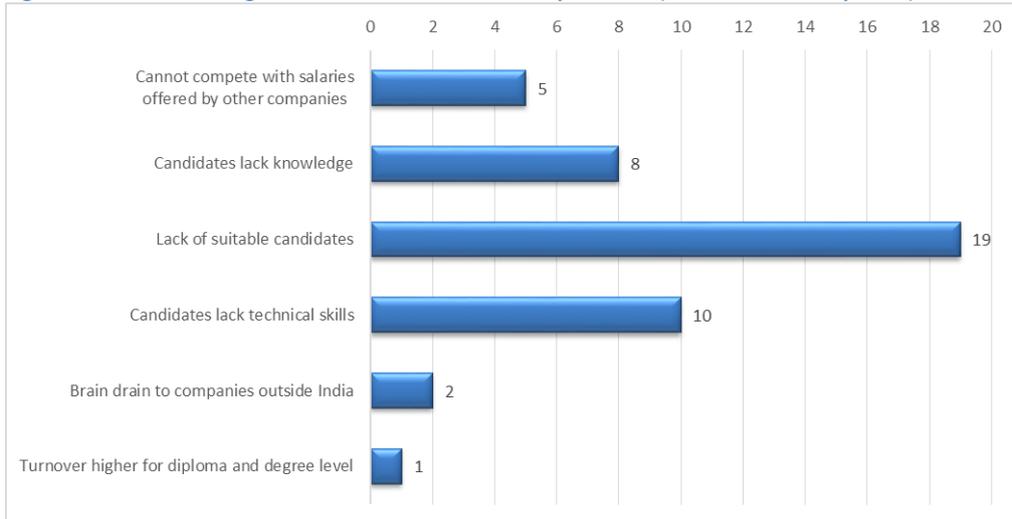
Table 9 – Reported issues concerning turnover, recruitment and skill problems for the most common job roles

Job role category	Number of times mentioned (N)	Reported issues (in % of number of times mentioned):		
		Higher than average turnover	Recruitment problems	Skill problems
Total	584	11%	22%	10%
Design roles:				
CNC Programmer	32	9%	31%	13%
Designer / draughtsman	78	5%	19%	8%
Machinist roles:				
CNC operator	40	33%	48%	20%
CNC setter cum Operator	17	12%	18%	6%
Conventional machine operator	63	14%	35%	16%
Operator and/or setter (EDM)	16	13%	25%	13%
Production Roles:				
Assembly - Fitter – Electrical & electronic	30	13%	23%	7%
Assembly - Fitter – Mechanical / Maintenance	29	10%	17%	7%
Assembly - Tool and Die Maker	14	7%	43%	29%
Component Fabrication and Preparation	13	15%	23%	23%
Component Fabrication and Preparation - Fabrication Fitter	19		21%	
Quality, Managerial and Supervisory roles	44		7%	
Welding and Related Roles	18	17%	33%	6%
Painting and Coating Roles	7	29%	29%	
Quality Roles	17	12%		
Helper	41	10%	15%	12%
Projects and Planning Roles	70	6%	11%	7%
Marketing, Research and Service Roles	18	17%	33%	17%
Administrative Roles	11	9%		
Other (production) Roles	7	14%	14%	

Seventy-seven companies (73%) reported problem in retaining and/or recruiting workers for the most common job roles. Fifteen companies did not specify the nature of the problems, but the remaining 63 companies gave one or more reasons and/or explained the problems in more detail. Their answers are summarised in Figure 1.

The most reported recruitment problem was the non-availability of suitable candidates in the labour market. Other reported problems were that candidates lack (technical) skills or knowledge and a few companies mentioned that the candidates lack soft skills like creativity and problem solving skills. A small number of companies reported that they cannot compete with the salaries offered by other companies. Two participants thought that workers with the right qualifications prefer to work outside India, and another respondent mentioned that the turnover was especially high among workers at diploma and degree level.

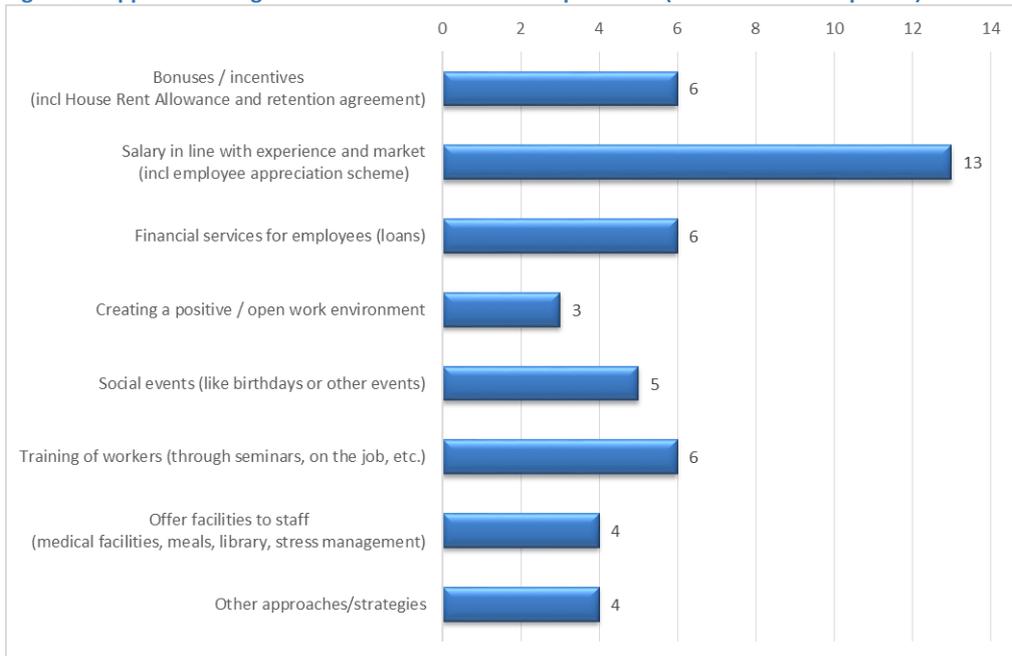
Figure 1 - Reasons for higher turnover and recruitment problems (in number of companies) *)



*) Companies could refuse to answer or give more than one answer, so the number of reasons can differ from the number of companies.

Companies have taken different measures to cope with the higher turnover and/or recruitment problems (see Figure 2). The most common measures were financial, for example by paying salaries that are in line with the experience of workers and with the demand in the market. Others provide loans to employees or give bonuses and other financial incentives.

Figure 2 - Approach to higher turnover and recruitment problems (in number of companies) *)



*) Companies could refuse to answer or give more than one answer, so the number of approaches can differ from the number of companies.

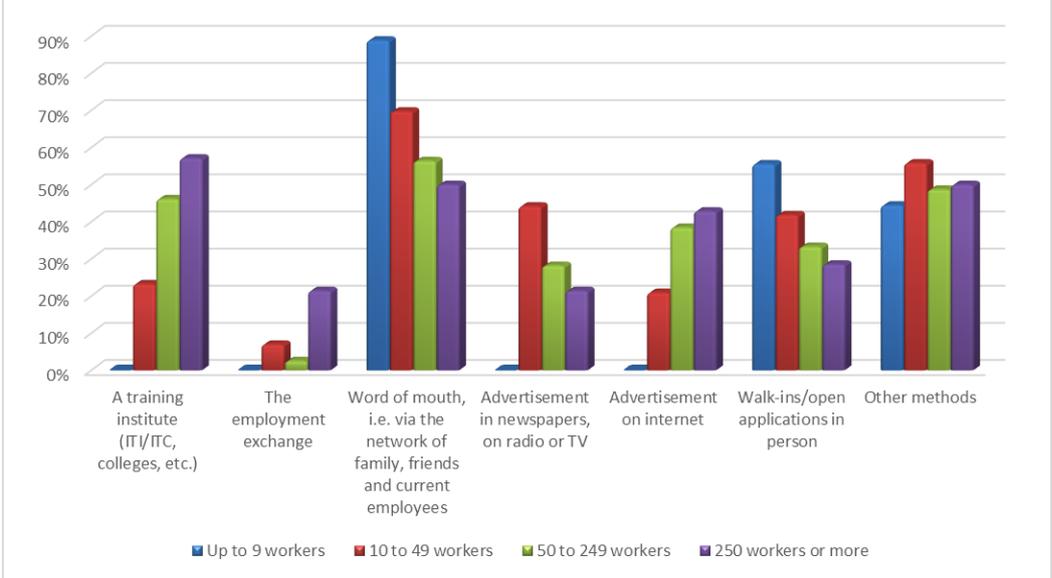
Companies also reported taking non-financial measures. Some companies organised social events like birthday celebrations, get-togethers and trips for employees, while others offered workers medical facilities, meals, library with books in the local language or even stress management training. Three companies found a positive and open working environment important, whereas four

companies mention “other approaches”³. Lastly, six companies mentioned the training of existing and new workers as a way to retain workers as well as to overcome recruitment problems.

Recruitment methods and criteria

Participants were asked to explain how their company recruits new employees. Their responses are presented in Figure 3 and further broken down by sub-sector, division and company size in Table 21, Table 22, Table 23 in Appendix 2.

Figure 3 - Methods to recruit new employees by company size (in terms of number of workers)



Informal recruitment methods were used most: more than six out of ten companies recruited new employees through word of mouth, i.e. via the company’s network, the network of family, friends and current employees, etc. More than a third recruited walk-ins and people that sent an open application (i.e. applying in general, not for a specific position that was advertised). Almost a third of the companies recruit via training institutes. This could be formal campus recruitment, but could also be more informal, i.e. through internships, notice boards in schools, etc.

Concerning the more formal recruitment methods: about 30% of the companies used advertisements in newspapers, on radio or on TV and recruitment via online advertisements was used by almost as many companies. Recruitment via the employment exchange is not popular: only 7% of the companies mentioned this as a recruitment method. Obviously, the choice for one or more “formal recruitment methods” would depend on whether potential candidates are likely to use these media. For example, older workers are less likely to use the internet, while young persons may be less likely to read newspapers. Likewise, positions that require a higher qualification may be advertised online, while recruitment for positions that require an ITI certificate could require a different approach.

³ Including good working circumstances (green manufacturing), direct interaction of the company with schools, a learn and earn scheme and regular promotions of staff.

Half of the companies indicated using “other” recruitment methods. Analysing their open answers showed (see Figure 18 in Appendix 2) that about one in ten companies recruited workers by putting up advertisements on notice boards or on the company gate (see Picture 1) and an almost similar share of companies recruited via placement or consultancy agencies.



Picture 1 - Informal "other" recruitment methods: putting up advertisements on notice boards or on the company gate

Figure 3 clearly shows that companies of different sizes use different recruitment methods. Though all companies prefer informal recruitment methods, the preference is stronger among micro-sized (9 workers or less) and small companies (10 to 49 workers). Typical for small companies is that they are more likely to use advertisements in newspapers, on radio and TV than larger or smaller companies. Medium-sized (50 to 249 workers or more) and large companies (250 workers or more) recruit more often via a training institute and via advertisements on internet. There are no major differences between the other sub-sectors (see Table 21 in Appendix 2) or between the different divisions (see Table 22 in Appendix 2).

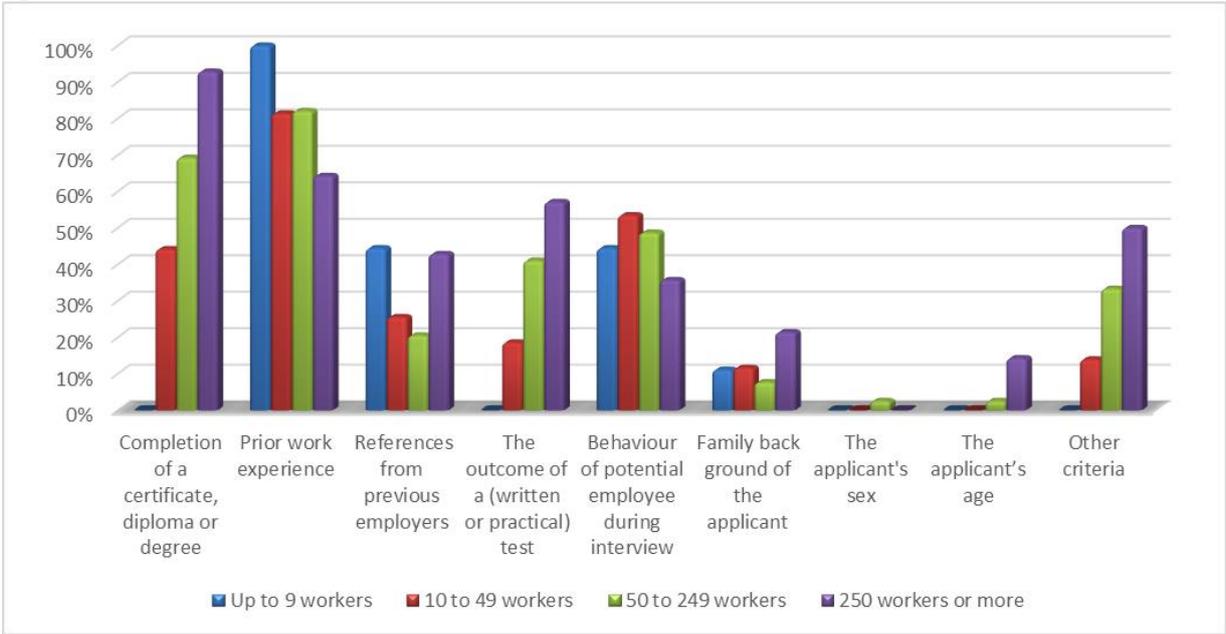
The strong preference for informal recruitment methods and the small share of companies that recruit workers through an employment exchange are similar to the findings in the enterprise survey in Maharashtra’s automotive industry (India-EU Skills Development Project, 2013). The authors mentioned that this was in line with international findings. They explained: “the World Association of Public Employment Agencies has highlighted that the majority of jobs worldwide are filled through word of mouth” and that “only 9% of jobs are filled through public and private employment agencies”.

Companies were not only asked how the potential candidates are found (i.e. recruitment), but also about the criteria that candidates should meet (i.e. selection criteria). Their answers are summarised in Figure 4 and broken down according to sub-sector, division and company size in Table 24, Table 25 and Table 26 in Appendix 2 respectively).

Three selection criteria were mentioned most, i.e. prior work experience, the completion of a certificate, diploma or degree, and the behaviour of potential employees during the interview. Furthermore, three out of ten companies made selections based on the outcome of a written or practical test and an almost similar share used references of previous employers. Very few companies took the family background and the applicant’s sex into account and a quarter of the company used other selection criteria.

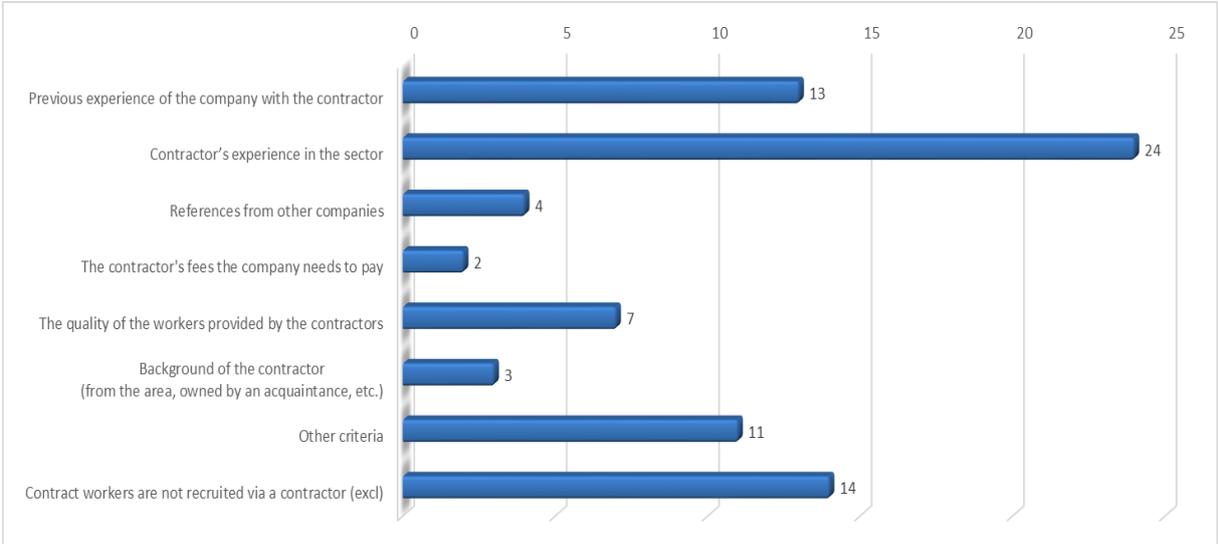
Figure 4 illustrates that selection was done differently in companies of different sizes. Having a certificate, diploma or degree was not considered important in the micro-sized companies (with 9 workers or less) but was used as a selection criterion in practically all large companies. Similarly, micro-sized companies did not use a (written or practical) test, which was more popular among the medium-sized and large companies. In contrast, micro-sized companies preferred to select new employees based on prior work experience and, to a lesser extent, references of previous employers. Such references were important for large companies, but not so much for small and medium sized companies. Companies of all sizes took the behaviour of the potential employee during the interview into account during the selection process.

Figure 4 - Criteria used for the selection of workers



A quarter of the companies, especially medium sized and large companies, mentioned other selection criteria. Other criteria mentioned included the applicant's school grades, the willingness of the applicant to work under harsh conditions, specific skills, the ability of the applicant to complete a specific in-company training and the applicant's place of residence (i.e. close to work).

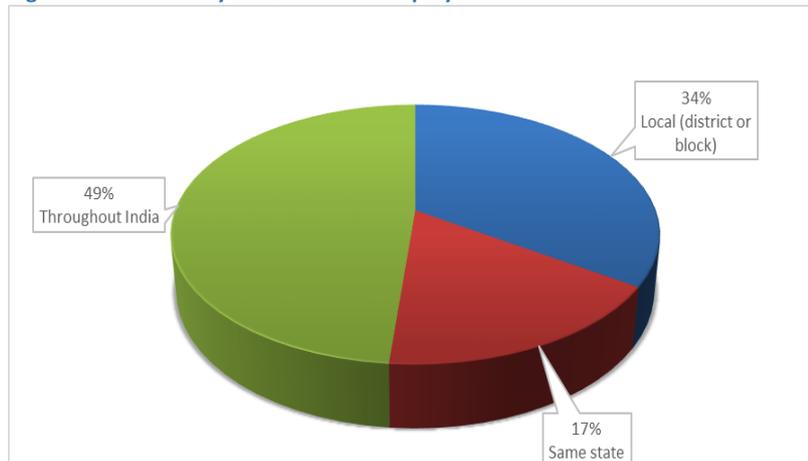
Figure 5 - Criteria for the selection of contractors



Contract workers are employees that are seconded by their (legal) employer, i.e. a contractor, to other companies. Fifty-five of the companies in this survey have contract workers, and these companies were asked how they select a suitable contractor. Their answers have been summarised in Figure 5. It is obvious that the most important criterion was the experience of the contractor in the sector, followed by previous experience of the company with the contractor. A smaller number of companies mentioned the quality of the workers provided by the contractor and references of other companies. The contractor's background, and the contractor's fees were less important selection criteria. Eleven companies (i.e. 20%) chose the option "other", but most did not explain what other criteria they used. Fourteen companies (i.e. 25%) indicated that their contract workers were not recruited via a contractor but in a different way.

The selection of the contract workers was usually a combined effort of the contractors and companies: contractors made an initial selection of the candidates for an interview with the company. The company would then select the contract workers they considered suitable for the work.

Figure 6 – Where do you recruit new employees?

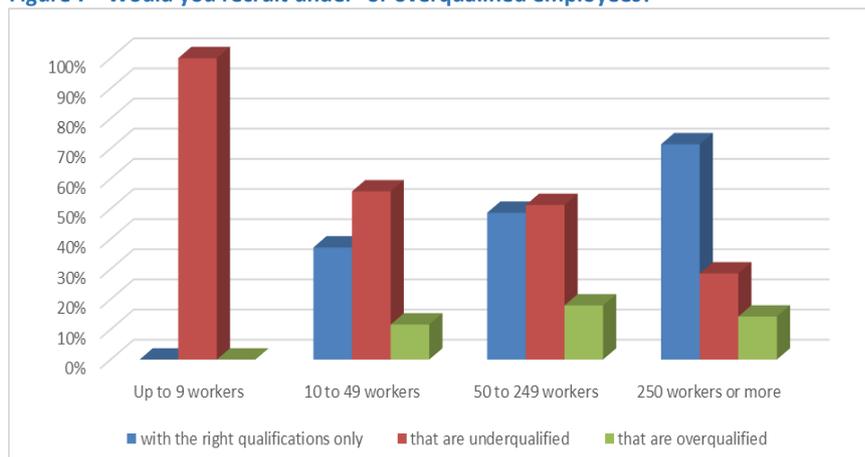


Almost half of the participating companies recruited employees from all over India (see Figure 6), while about a third preferred workers living near the company. The remaining companies limited their searches to the state of Maharashtra.

Some companies explained that for lower level jobs, recruitment was mostly directed at the district or block in which the company is located. Other

companies would welcome anyone to come and work with the company as long as he or she was willing to move to city in which the company is based. Some participants preferred workers from other states, because they considered these workers to be especially flexible, hardworking, reliable, and because these workers had fewer family obligations they would be available for work at any time. Workers recruited from other states would get 2 months leave per year to visit their families and spend the remaining 10 months working for the company. In one case, the respondents preferred recruiting graduates from good quality training institutes in specific states.

Figure 7 - Would you recruit under- or overqualified employees?



A big share of the participants (43%) preferred to recruit workers with the right qualifications, but an even bigger share (54%) of companies would recruit underqualified workers. In contrast, very few companies would recruit

overqualified staff (see Figure 7 and Table 30 in Appendix 2).

There are clear differences between companies of different sizes. Larger companies preferred to employee workers with right qualifications, but micro-sized companies (with 9 workers or less) preferred candidates that are under-qualified. Preferences of small and medium-sized companies or less extreme, but follow the same trend. It seems that the bigger the company was, the stronger its preference for workers with the right qualifications.

The preference of employers to recruit staff with the right-qualifications will depend on the remuneration, the level of specialisation required for the job role and on the situation on the labour market. The reluctance of employers to work with over-qualified staff could result from the expectation that over-qualified workers will demand higher salaries or that they will quickly find other (better) jobs. On the other hand, working with underqualified workers has the advantage that salaries tend to be lower than for workers with the right qualifications and that these employees can be trained exactly according to the employer's requirements. And though some specialised job-roles simply cannot be done by someone without the right qualifications other more general jobs could even be done better by overqualified workers. One could conclude that the preference of smaller companies for underqualified workers will result from employers to keep labour costs low, to secure their labour force (underqualified workers have fewer opportunities in the labour market) and to train workers according to their specific needs. The more specialised nature of the position in larger companies would be an explanation for the preference of larger companies for workers with the right qualification – apart from the fact that larger companies can choose from a larger pool of interested candidates because bigger companies generally offer better salaries, career perspectives, and working environment. These factors will need to be taken into account when developing initiatives concerning recognition of prior learning.

Participants have indicated the share of women and disabled workers in their current workforce (see paragraph 4.2), but have also been asked to indicate for which most common job roles they would consider women and disabled workers. Their answers are summarised in Figure 8 and in Table 31 in Appendix 2. Just over half of the participants would consider recruiting women for one or more of the most common job roles and 30% would consider recruiting disabled persons. There were no major differences between the different divisions and between the different sub-sectors, except for companies in the unorganised sector, who were less willing to recruit women and not willing at all to recruit disabled persons. Though the reason for the companies' preferences has not officially been part of the questionnaire, several respondents explained during the interview that they felt that the company was not a suitable environment for women or disabled persons, because the work can be dangerous, the workplace not clean and because physical strength is important.

The companies that would consider women for the most common job roles, were asked to specify for which job roles they might recruit women and disabled persons. Respondents mentioned 18% of the most common job roles for women and 8% of the most common job roles for disabled people (see Figure 8). Job role categories mentioned most for women are designer / draughtsman, CNC Programmer, CNC (setter cum) operator, and Quality, Managerial and Supervisory roles. Fewer job role categories were mentioned for disabled people, i.e. CNC Programmer, designer / draughtsman and CNC operator. Less mentioned, but more than other job role categories, were assembly – fitter positions (electrical & electronic and mechanical / maintenance). The information about the willingness to consider women and differently abled persons should be used as career guidance information. Women and disabled persons considering taking part in training for certain job roles will need to be aware of the reluctance of employers to consider them for the associated job roles.

Figure 8 - Most common job roles for which women and disabled persons would be considered

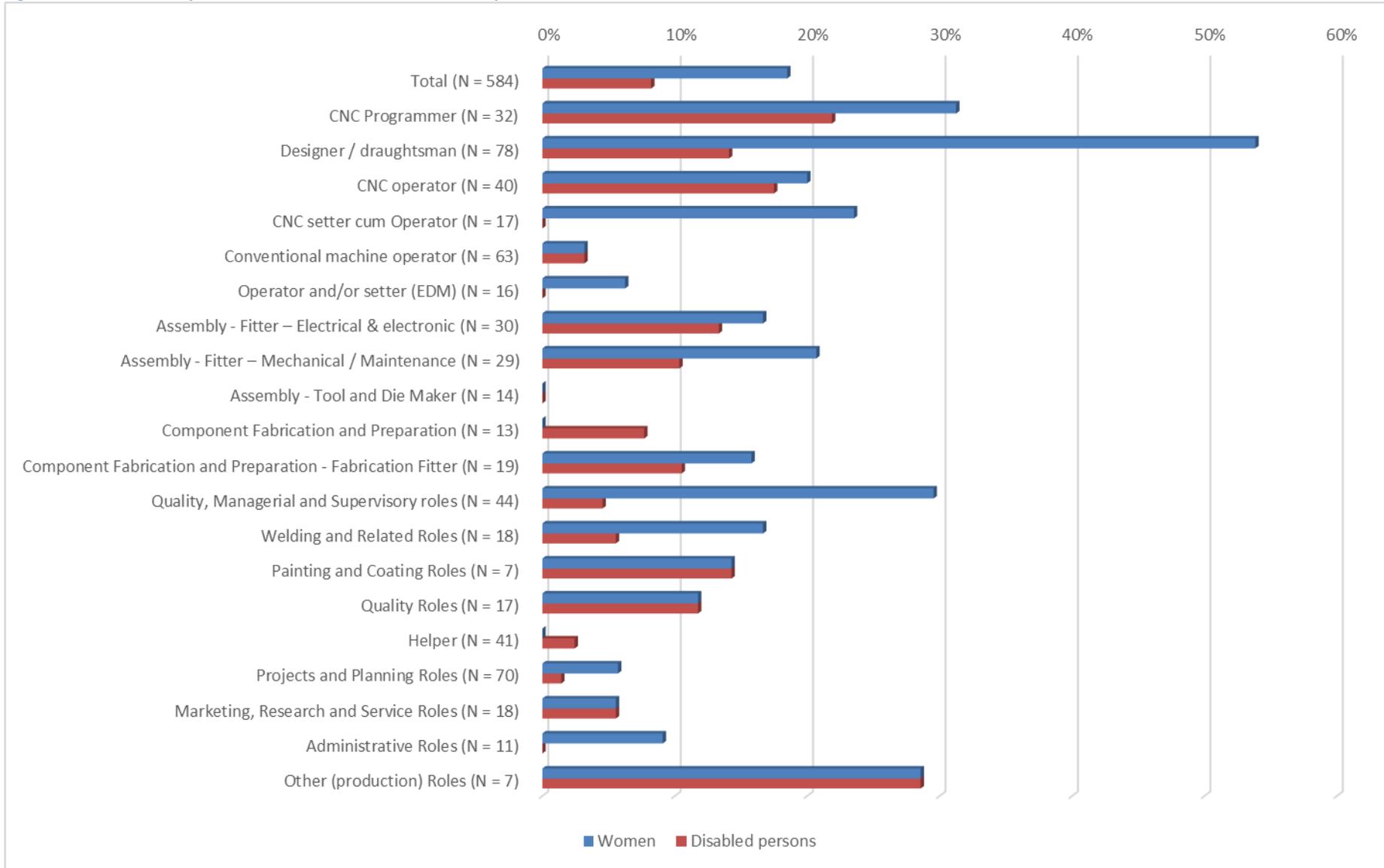
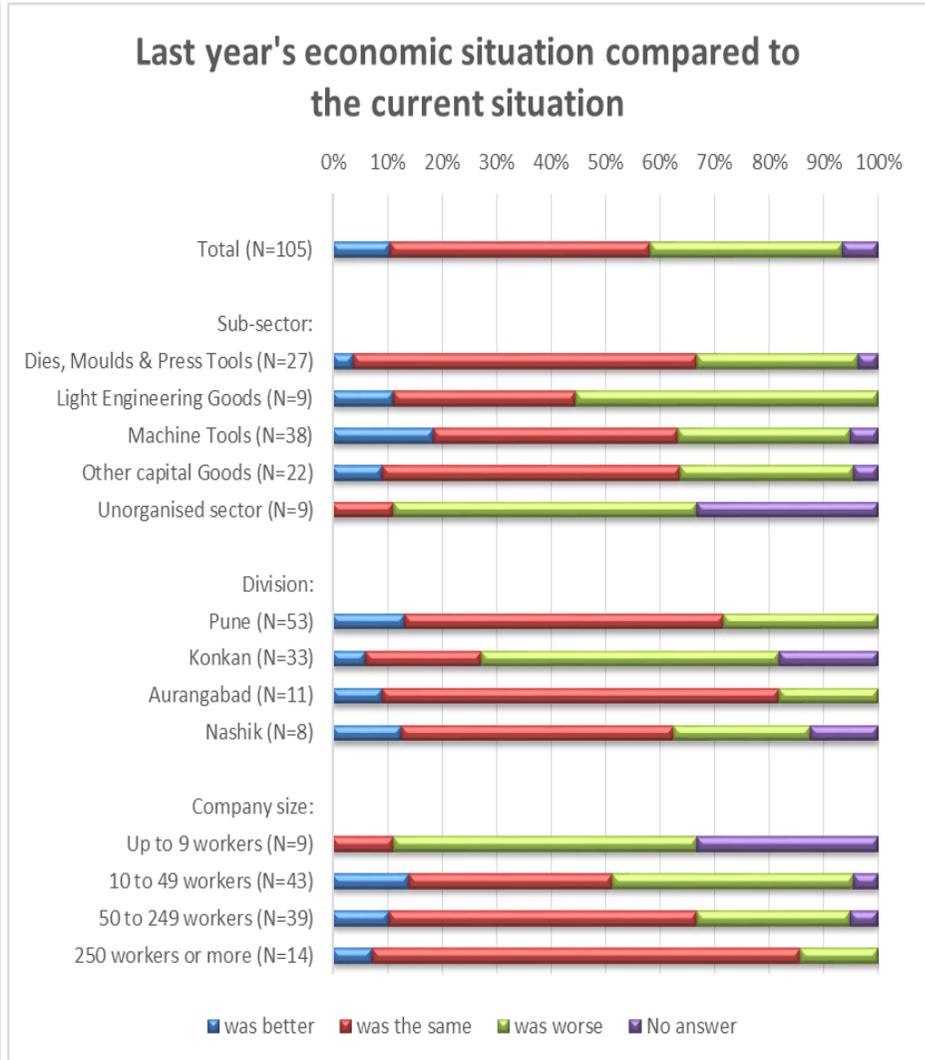
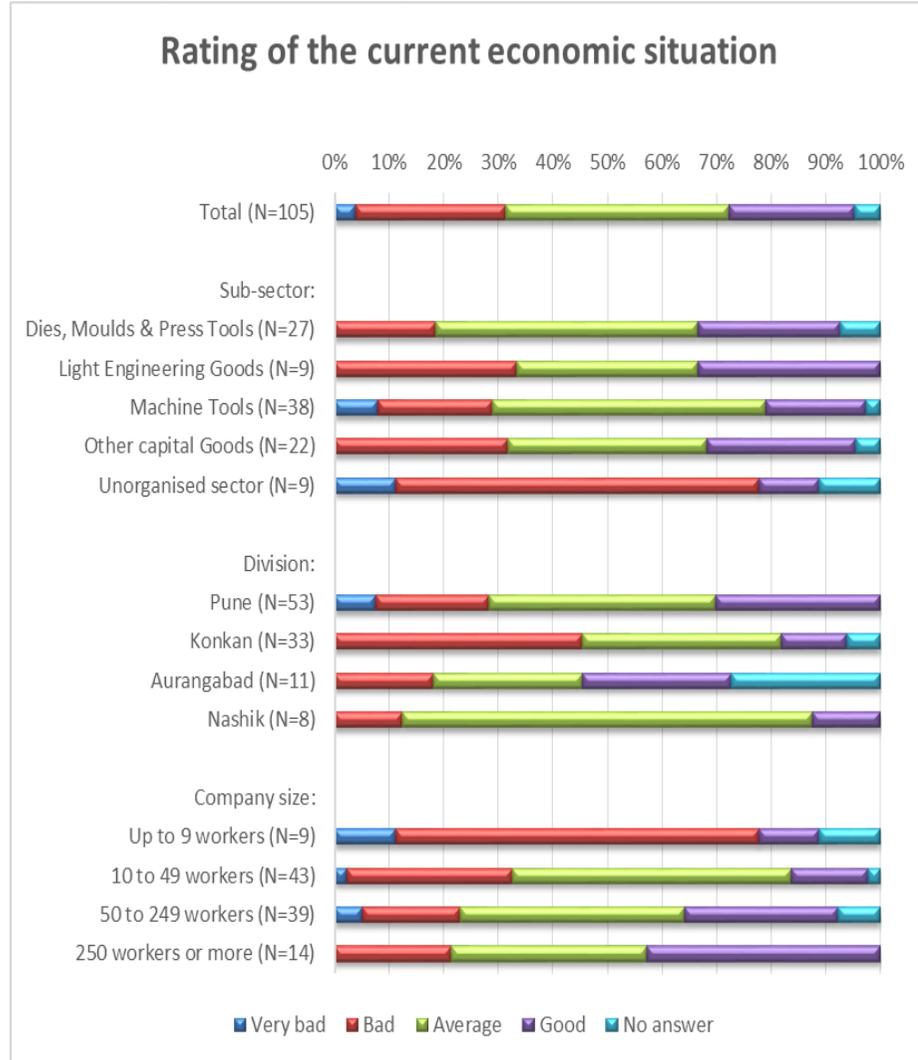


Figure 9 - Rating of the current and last year's economic situation



4.4 Opinions on and expectations for the economic situation of the sector

Current and last year's economic situation

Employers generally know best what goes on in the sector. That is why the participants have been asked about their opinion of the current economic situation and their expectations for future developments. The assessments of the current economic situation and of last year's economic situation are summarised in Figure 9 above.

Respondents were not positive about the current economic situation. Though a quarter of the respondents felt that the current situation was good, almost a third of the respondents said that the current economic situation is bad or very bad. Two out of five respondents rated the current economic situation as average. Yet there were some differences between the different sub-sectors. For example, representatives of companies producing dies, moulds and press tools were relatively positive: almost a quarter rated the economic situation as good and almost half of them felt that the economic situation was average. In contrast, representatives of the unorganised sector were in a very negative mood: the overall majority rated the situation as bad or very bad. There were not many differences in opinion between the remaining sectors. Looking at the different divisions, it is apparent that the mood in Konkan was more negative than elsewhere and that the share of companies that felt the current economic situation was good is bigger in Pune than in the other divisions. Lastly, the information in Figure 9 suggests that the size of the company affected the rating of the current economic situation: the larger the company, the bigger the share of respondents that rated the situation as "good" and the smaller the share of respondents that rated the economic situation as bad or very bad.

When asked about last year's economic situation, more than a third of the respondents said that last year was worse than this year and 45 % said that the situation was more or less the same. Only one in ten respondents felt that last year was better than this year. Figure 9 shows that this is not consistent for all categories of companies. A relatively large share of companies in Konkan felt that last year's economic situation was worse than this year. The same was true for companies producing light engineering goods and for companies in the unorganised sector.

More interesting than the opinion about last year's economic was better or worse than the current situation is whether companies have reduced or increased their workforce in the last year. The answers of the respondents have been presented in Table 10. The table shows that 10% of the participating companies had fewer workers than last year, on average 15 workers less. Yet 24% of the participating companies currently have more workers than last year, on average 15 workers more. The remaining 61% report having the same number of workers as last year. This information means that the total number of workers in the participating companies has increased (by 0.9%) in the last year. Considering the relatively small number of companies participating in the survey and the non-probability sampling as described in the methodology chapter, we cannot conclude that the size of the reported changes is representative for the total sector, but the direction of the change may well be in line with the developments in other companies.

Some groups of companies reported substantially better figures than average. For example, 30% of the companies producing dies, moulds and press tools had more workers than last year and only 11% of the companies had fewer workers. Considering the average reported size of the changes and the average number of workers, the workforce in the participating companies that produce dies, moulds and press tools has increased in the last year by 4.7%. Likewise, a relatively big share of the companies based in Konkan division reported an increase of the workforce and very few companies report a decrease, resulting in an increase of 4.6%. Lastly, the workforce of medium-sized companies

in the survey has increased by 3.6% in the last year, which was the result of to a higher share of companies reporting relatively big increases and to the fact that companies that reported a decrease in the last year, reported a smaller decrease than average.

Table 10 - Changes in the size of the workforce in the last year

Variables	Number of companies	Average number of workers	Compared to last year, the number of workers is					No answer
			the same	lower		higher		
			% of companies	% of companies	Average number of workers less	% of companies	Average number of workers more	
Total	105	220,0	61%	10%	15,0	24%	14,6	5%
Sub-sector								
Dies, Moulds & Press Tools	27	88,4	56%	11%	8,3	30%	17,3	4%
Light Engineering Goods	9	313,2	78%	11%	5,0	11%	3,0	
Machine Tools	38	266,5	63%	8%	8,0	21%	13,6	8%
Other capital Goods	22	350,5	45%	18%	27,8	32%	16,0	5%
Unorganised sector	9	6,6	89%			11%	2,0	
Division:								
Pune	53	367,2	57%	11%	18,0	32%	14,5	
Konkan	33	59,5	67%	3%	14,0	21%	15,0	9%
Aurangabad	11	85,1	55%	18%	10,0	9%	12,0	18%
Nashik	8	93,1	75%	25%	11,5			
Company size:								
Up to 9 workers	9	6,6	89%			11%	2,0	
10 to 49 workers	43	28,1	67%	12%	6,4	19%	3,9	2%
50 to 249 workers	39	109,1	49%	10%	12,8	31%	16,9	10%
250 workers or more	14	1255,9	57%	14%	41,0	29%	32,0	

Respondents that reported a change in the workforce were asked if the most common job roles were affected by this change. Table 33 in Appendix 2 lists the reported changes per job role. As only 34% (i.e. 36) of the participating companies reported a change in the size of the workforce, the table includes information about 85 job roles.

Relatively big increases are mentioned for the job role categories CNC operators and for assembly - fitter – mechanical / maintenance: in the companies that reported an increase, the total number of workers in these job role increased by 10 and 11.3 on average respectively. Smaller but still substantial (average) increases are reported for marketing, research and service roles (6.0 per company) and for assembly - tool and die maker (5.8 per company). Decreases were reported for quality roles (-5.0 per company), helpers (-4.5 per company) and for component fabrication and preparation (-1.5 per company).

The explanation for the reported increases and decreases is not clear. The reported increase in the number of CNC operators seems to be in line with ongoing automation of the production. The decrease of workers in quality roles could be the result of the ambition to produce more efficiently – possibly also because of ongoing automation of the production process. Yet the decrease of helpers (working especially in the unorganised sector) does not fit with the finding that last year’s economic situation in the unorganised sector was worse than the current situation, unless the companies did

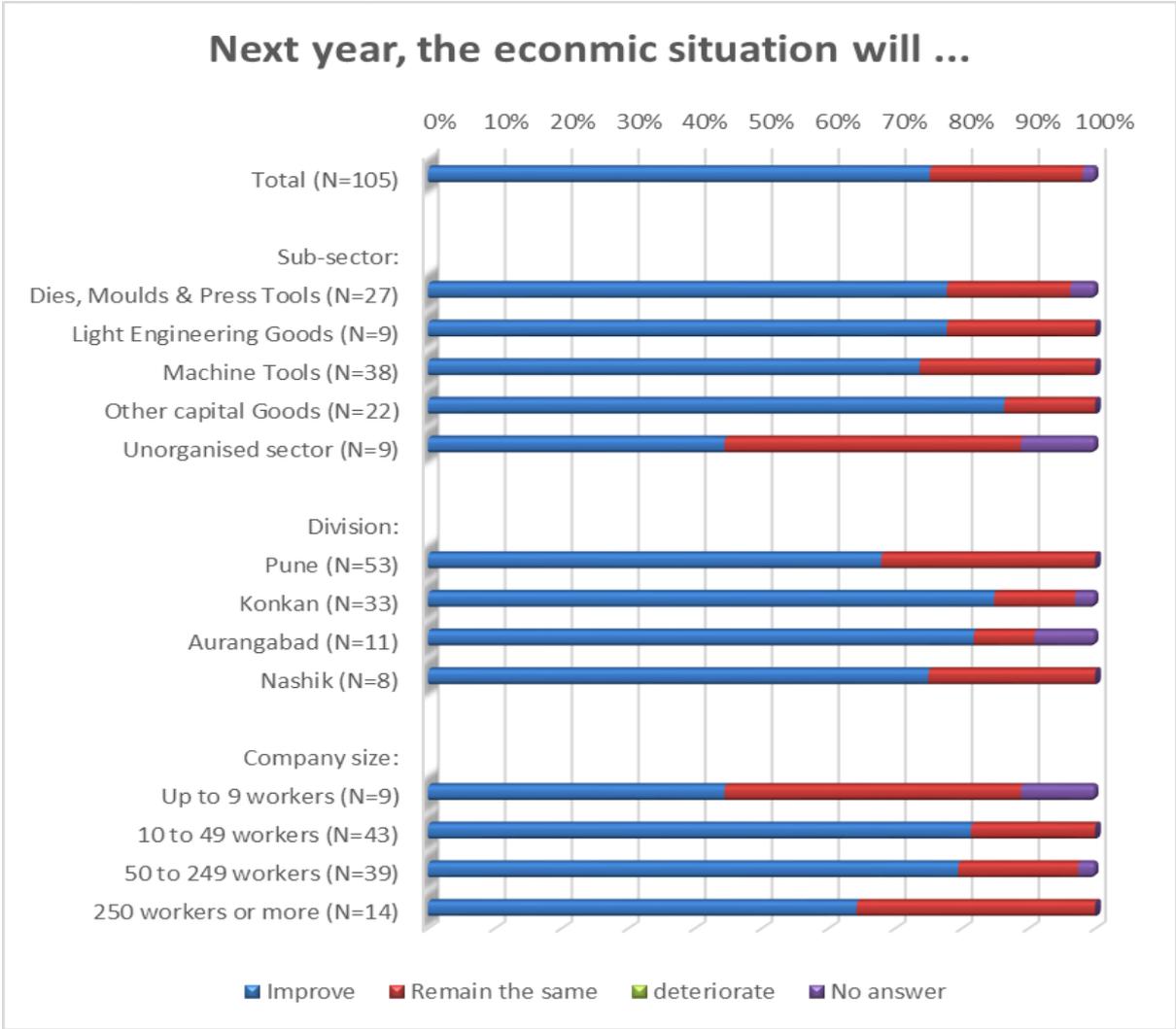
not recruit new helpers for the helpers that progressed to a more specialised job roles. Similarly, it is unclear why there was a reduction in the number of workers in component fabrication and preparation and an increase for assembly fitter-mechanical/maintenance increases. The validation of these findings will need to be taken prior to or during the next study on this or on a related subject.

Expected economic developments

Respondents were not only asked to think about the past, but also about the future. They were questioned about their expectations for the year to come, whether the company plans capital investments for that period and if they expect their workforce to change.

Figure 10 shows that the industry appeared positive about the future: three out of four participants believed that the economic situation would improve in the year to come, while 19% expected the situation to remain the same. The remaining 4% did not expect the situation to deteriorate, but preferred not to answer this question.

Figure 10 - Expected economic developments



Though the mood was generally positive, there were some differences between different groups of participants. For example, a much smaller share of participants from the unorganised sector expects the economic situation to improve while a relatively larger share of respondents of companies producing “other” capital goods expected positive economic developments. And a bigger share of respondents based in Aurangabad and Konkan expected the economic situation to improve than

respondents based in Pune, which may be because a relatively larger share of the Pune based companies rated the current economic situation as “good”. Lastly, small and medium sized companies felt more confident about the future economic situation than the large and micro-sized companies.

Another indicator of the level of confidence of the business representatives is whether companies plan for capital investments, in this case in the next year. Table 11 shows that about two-fifths (41%) of the participating companies did plan to invest new capital in the year to come.

Table 11 - Does the company plan for capital investments in the next year?

Variables	Number of companies	Does the company plan for capital investments in the next year?		
		No	Yes	No answer
Total (N=105)	105	54%	41%	5%
Sub-sector:				
Dies, Moulds & Press Tools	27	52%	44%	4%
Light Engineering Goods	9	56%	44%	0%
Machine Tools	38	50%	42%	8%
Other capital Goods	22	50%	45%	5%
Unorganised sector	9	89%	11%	0%
Division:				
Pune	53	49%	47%	4%
Konkan	33	67%	30%	3%
Aurangabad	11	55%	27%	18%
Nashik	8	38%	63%	0%
Company size:				
Up to 9 workers	9	89%	11%	0%
10 to 49 workers	43	60%	37%	2%
50 to 249 workers	39	38%	54%	8%
250 workers or more	14	57%	36%	7%

Table 11 also shows that the answers of the unorganised sector companies were in line with the finding that fewer unorganised companies expect the economic situation to improve than in other sub-sectors: only one out of the nine participating unorganised sector companies had capital investment plans. The share of other capital goods producing companies that plan investments was a bit higher than average. Furthermore, capital investment plans were mentioned more by small and medium-sized companies than by micro-sized and large companies. And though a relatively large share of companies in Konkan and Aurangabad division expected the economic situation to improve, a much smaller share of companies in these divisions had capital investment plans, while many more companies in Pune and Nashik are considering investments. The variation in company sizes or sub-sectors over the different divisions does not provide an explanation for this phenomenon. It is

possible that these findings only seem contradictory and are in fact very logical, but for a final decision about this, the finding would need to be discussed further with industry experts.

The overall majority (88%) of the capital investments plans involves the adoption of new technology that will change the way of working in the company, for example by investing in different machines.

All respondents were asked if they expected the size of the workforce to change in the next 12 months. One in ten companies did not answer this question and about half of the remaining companies expected that the number of workers would remain the same (see Table 12). Of the remaining 49 companies, only 6 of the respondents expected that the number of workers would decrease, on average by 15 workers, and 43 companies foresaw an increase of the workforces, on average by 15 workers as well. Based on the average number of workers per company, this would be an increase of the workforce of the participating companies by about 3%.

The expected changes in the workforce was relatively small in companies producing machine tools, because a smaller share of companies expect a smaller than average increase. On the other hand, companies producing other capital goods expected a higher increase: combining the figures in the table on the expected changes and the average number of workers leads to an increase of almost 5%. This finding is in line with the positive mood in these companies concerning future economic developments and that relatively many companies producing other capital goods planned for capital investments. Also in line with the findings described above is that the overall majority of the unorganised sector generally do not expect any changes in the size of their labour force, while the figures reported by small companies (with 10 to 49 employees) implied a very big increase of the workforce of well over 12%. Medium sized companies would also grow, but only slightly more than the average figures.

Companies in Nashik generally expected to have a larger workforce by next year. In Konkan, relatively few companies expected the workforce to increase in the year to come, but those who did, expected a bigger than average increase of the workforce, leading to a increase of about 5%. This finding is in line with the finding that Konkan division based companies expected the economic situation to improve, but not (as mentioned above) with the finding that relatively few companies of this group plan capital investments. These findings require further validation.

Companies that expected size of the workforce to change were also asked to indicate which current job roles would be affected and which new job roles might be introduced. Of the 49 companies that expected the size of the workforce to change, only 11 answered this question. Their answers are summarised in Table 34 in Appendix 2. Together, the 11 companies mentioned 102 job roles, 1 for which the number of workers would decrease and 101 for which the number of workers would increase. A closer look at the data reveals that 17 of the job roles mentioned would be new job roles for the company, while the remaining 84 job roles for which the respondents expected the workforce to increase, were already present in the company. More precisely, the workforce of the 11 companies is expected to grow especially for the job role categories welding and related roles and “component fabrication and preparation - fabrication fitter”. The participating companies expected that the number of workers in these job roles would grow by 166 and 162 workers respectively, i.e. 33 and 32 on average per company. Other job role category for which the participating companies expected an increase were CNC operators (115 in total or 8.8 per company on average), conventional machine operators (85 in total or 7.1 per company on average) and staff in projects and planning roles (79 in total or 8.8 per company on average). The findings support the decision of the CGSC to focus part of the survey on the skills and knowledge of fitters - fabrication (see paragraph 1.14.7).

Table 12 - Expected changes in the size of the workforce in the next year

Variables	Number of companies	Average number of workers	In the next year, the number of workers is expected to be					No answer
			the same	lower		higher		
			% of companies	% of companies	Average number of workers less	% of companies	Average number of workers more	
Total	105	220,0	44%	6%	15,0	41%	19,5	10%
Sub-sector								
Dies, Moulds & Press Tools	27	88,4	30%	15%	17,5	44%	13,5	11%
Light Engineering Goods	9	313,2	44%			44%	16,3	11%
Machine Tools	38	266,5	53%			37%	13,7	11%
Other capital Goods	22	350,5	27%	9%	10,0	55%	32,9	9%
Unorganised sector	9	6,6	89%			11%	25,0	
Division:								
Pune	53	367,2	42%	2%	10,0	57%	21,1	
Konkan	33	59,5	58%	6%	3,8	15%	21,0	21%
Aurangabad	11	85,1	36%	27%	7,2	9%	20,0	27%
Nashik	8	93,1	13%			88%	11,7	
Company size:								
Up to 9 workers	9	6,6	89%			11%	25,0	
10 to 49 workers	43	28,1	30%	7%	8,3	47%	8,8	16%
50 to 249 workers	39	109,1	46%	8%	21,7	38%	14,7	8%
250 workers or more	14	1255,9	50%			50%	59,9	

The last question of this section in the questionnaire was whether participants expected that their workforce would need new skills in the year to come. See Table 35 in Appendix 2 for a detailed breakdown of the answers of the respondents. The table shows that the share of respondents that expected that the skills required from the workers would remain the same is more or less as big as the share of respondents that expected that other skills would be required. A change in the required skills was especially expected in the sub-sectors light engineering goods and machine tools, while the overall majority of the respondents from the unorganised sector did not expect any changes. Furthermore, relatively many companies based in the Konkan division expected their skill requirements to change in the year to come, while the opposite was the case for participating companies in Pune division. In terms of company size, the table shows that changes were especially expected by small companies with 10 to 49 workers.

The respondents have specified what other skills they expected to be needed in the year to come. Their answers have been analysed (see Appendix 5) and summarised in Table 36 in Appendix 2. The 50 respondents mentioned 76 different skills, of which the majority involved needing very practical and concrete skills. Interesting is that 10 respondents felt that they would need better social skills from their workforce and that 8 respondents wanted the workers to combine different skills rather than specialising in one specific skill. Six respondents wanted their workers to have better technical skills, but did not specify what skills exactly, and five respondents did not answer or could not answer this question yet, for example because it would depend on the adoption of new technology.

The skills mentioned were not new for the sector, but may well have been new for the company in question. However, it is also possible that some of the participants misunderstood the question and mentioned which skills in their workers needed to improve, rather than skills that were completely new to their workforce. The question may have to be articulated differently in a future survey on this subject.

4.5 Training and training providers

Training of employees and contract workers

One in five companies that participated in the survey had training departments and over a quarter had training plans/budgets (see Table 37 in Appendix 2). Not surprisingly, the bigger the company, the more likely it was for the company to have training department and a training plan / budget. And as participating companies that produced other capital goods had on average the biggest number of workers, a bigger share these companies had a training department and a training plan / budget than companies in other sub-sectors.

The figures also varied a bit between sub-sectors and divisions: in terms of average number of workers, companies based in Aurangabad and Nashik were medium sized, but a relatively big share of them had a training department and/or training plan / budget. On the other hand, an average Pune based company in this survey was large sized (i.e. with 250 workers or more), but relatively few companies had training departments while a comparatively big share had a training plan / budget.

According to Table 38 in Appendix 2, practically all companies trained new employees, which is in line with expectations. More interesting is that three quarters of the 55 participating companies that had contract workers gave contract workers the same training as their employees (see Table 39 in Appendix 2). However, this share was lower for companies producing machine tools or other capital goods and for companies based in Pune.

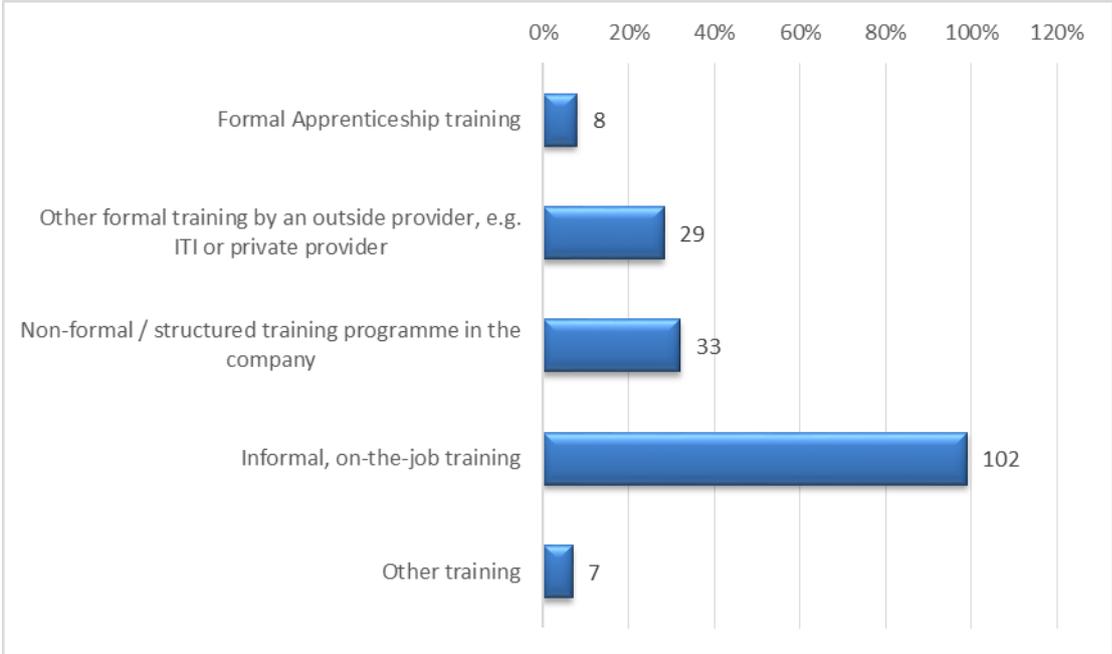
From the perspective of the companies, and this was confirmed by some of the respondents, it would have made sense to invest less in training of contract workers than in training of the

company’s own employees. After all, contract workers are only with the company as long as there is a requirement for their skills and as soon as contract workers leave, the investment of the employer in their skills is gone. The finding that the majority of the companies that participated in the survey gave contract workers the same training as their employees, suggests that these companies treated contract workers as their own employees. The reason for this could be that companies want to avoid tensions between employees and contract workers. An alternative explanation could be that employee and contract workers only get the minimum training needed to do their job and that not training contract workers would affect the quality of the production. It would make sense to consult industry experts on this subject and to conduct further research in the nature of the training offered by the companies and the role of contractors in training contract workers.

Respondents of companies that gave contract workers different training than their own employees were asked to explain the difference. Their answers are listed in Table 40 in Appendix 2, and suggest that the differences in training were generally the result of the temporary involvement of the contract workers in the company (contract workers then only got training that was directly related to the job they were supposed to do) or to the fact that contract workers were hired for a specific job that does not require any training.

According to the respondents, the most common type of training was on the job training (see Figure 11 below): practically all companies used this. About a third of the participants reported that non-formal/structured training programmes in the company were used, and slightly less (28%) reported that employees followed other formal training by an outside provider, e.g. an ITI or a private provider.

Figure 11 - Type of training use to train new employees *)



*) Y-axis in percentage of total answers, labels are absolute number of companies that chose the answer category.

There are some differences in training preferences in the sub-sectors: Table 41 in Appendix 2 shows that unorganised sector almost exclusively trained through on the job training. Companies producing other capital goods and light engineering goods mentioned more often non-formal in-company training, while this was mentioned by a relatively small share of the companies that produced dies, moulds and press tools. The latter category mentioned “other training” more than respondents from

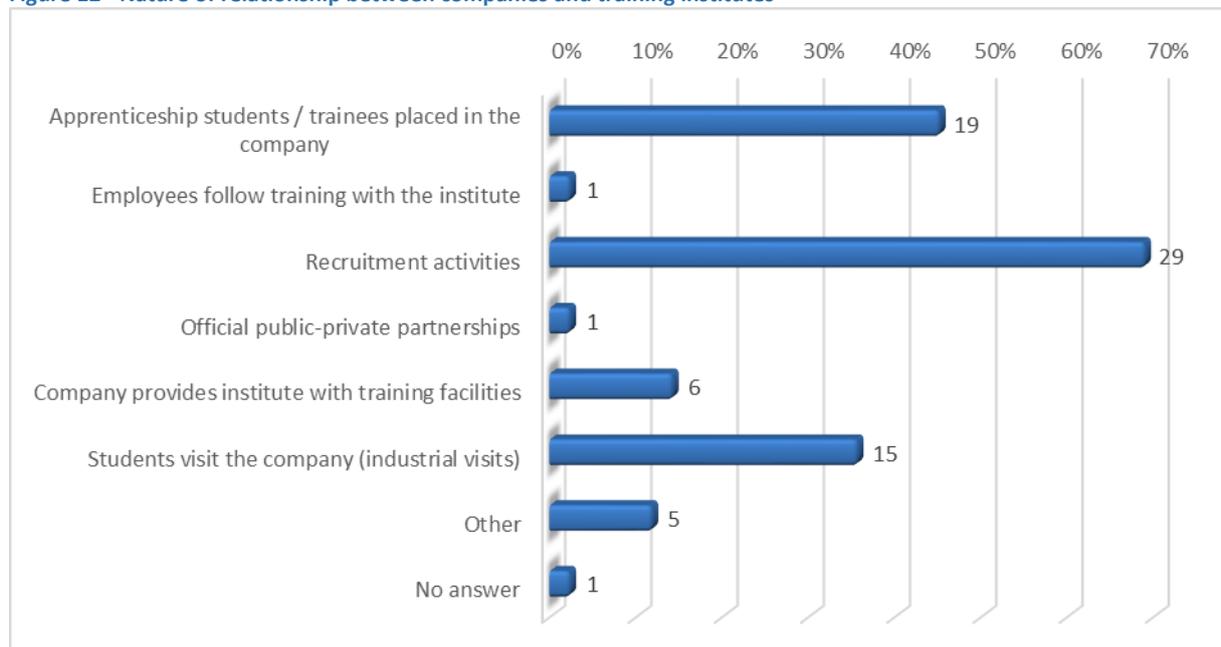
other companies. What “other training” was offered was not clarified by the respondents (see Table 42 in Appendix 2).

Relationships between companies and training providers

Two out of five participating companies had a direct relation with training providers (see Table 43 in Appendix 2). This share was higher in companies producing dies, moulds and press tools or machine tools and lower in the other sub-sectors. The companies in Konkan division differed substantially from the other participating companies: only 21% (7 out of 33) reported having a direct relation with an ITI or a private training provider. As to be expected, a much bigger share of the large companies had direct relationships with training institutes than smaller companies.

The nature of the relationship between the companies and the training institutes differed, but Figure 12 shows that recruitment activities were an important part for a big majority of more than two thirds of the 42 companies with a direct relationship with one or more training institutes. Another important element in the relationship with training institutes was that apprenticeship students or trainees of the training institutes were placed in the company (45%), and companies welcoming visiting students of training institutes (36%). A very small number (i.e. 6) of companies provided the institutes with training facilities and five companies qualified the nature of their relationship with training institute as “other”. The number of companies with a direct relation with training institute is too small to report on differences between sub-sectors: see Table 44 in Appendix 2 for more information.

Figure 12 - Nature of relationship between companies and training institutes *)



*) Y-axis in percentage of total answers, labels are absolute number of companies that chose the answer category.

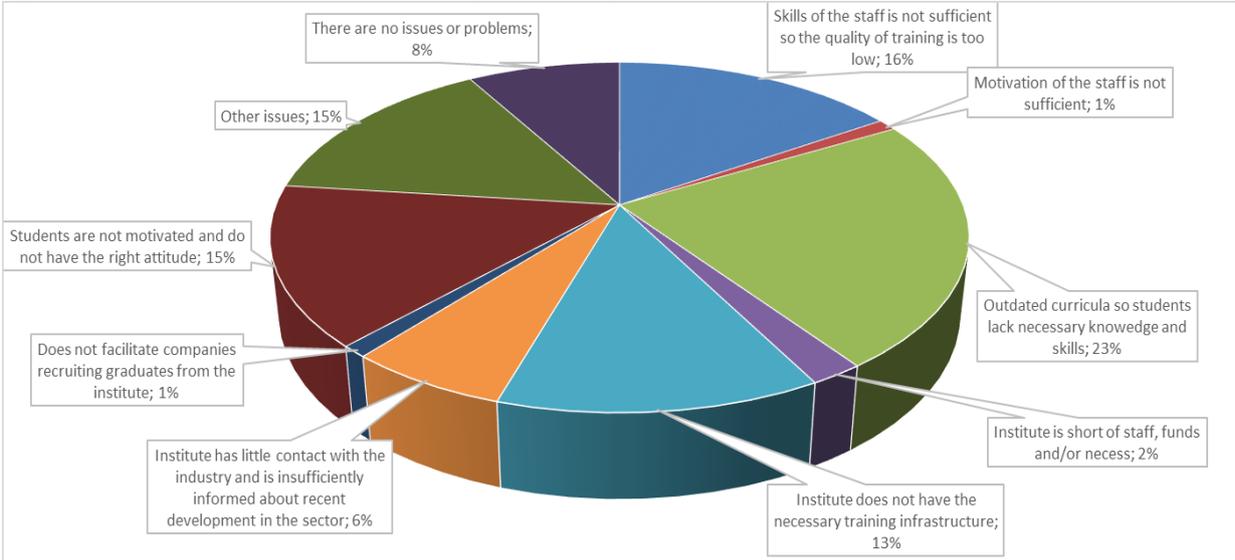
The descriptions of the relationships that were qualified as “other” are listed in Table 45 in Appendix 2. The nature of these relationships varied from activities in the context of Corporate Social Responsibility to another approach to recruitment and having students of ITIs or colleges work in the company. Two companies worked with the training institute on content, for example by organising seminars or giving lectures, and by asking the institute to give input for reports.

Company representatives were also asked about the issues they encountered when dealing with training institutes. The respondents reported 95 issues, of which almost a quarter referred to

outdated curricula resulting in students lacking necessary knowledge and skills (see Figure 13). A smaller, but still significant number of the reported issues concerned the skills of the institute’s staff being insufficient, students lacking motivation and not having the right attitude, and the absence of a good training infrastructure that would allow the training institute to train their students properly. Despite these complaints, many respondents said that they understood that institutes often do not have sufficient resources to offer better training. No big differences were found between companies based in different divisions or operating in different sub-sectors (see Table 46 and Table 47 in Appendix 2 respectively).

About 15% of the issues were “other issues”, which are listed in Table 48 in Appendix 2. Most of these “other” issues can be classified under one or more of the pre-defined categories. Generally, participants reported that there is a gap between the quality of the students with a certificate or diploma and the needs of the companies. They felt that training institutes should be aware of this and teach students about the latest technology, and offer “practice oriented” courses, so students can develop skills and knowledge that is in demand in the companies.

Figure 13 - Most important issues when dealing with training institutes



4.6 Employee benefits and the going rates for the most common job roles

Benefits for employees and contract workers

Apart from the financial package, companies offer employee several benefits. As these benefits contribute to the total cost of labour, respondents in the survey were asked which benefits they generally offered to their employees. Their answers are summarised in Figure 14 and in Table 49 and Table 50 in Appendix 2.

Figure 14 - Employee benefits

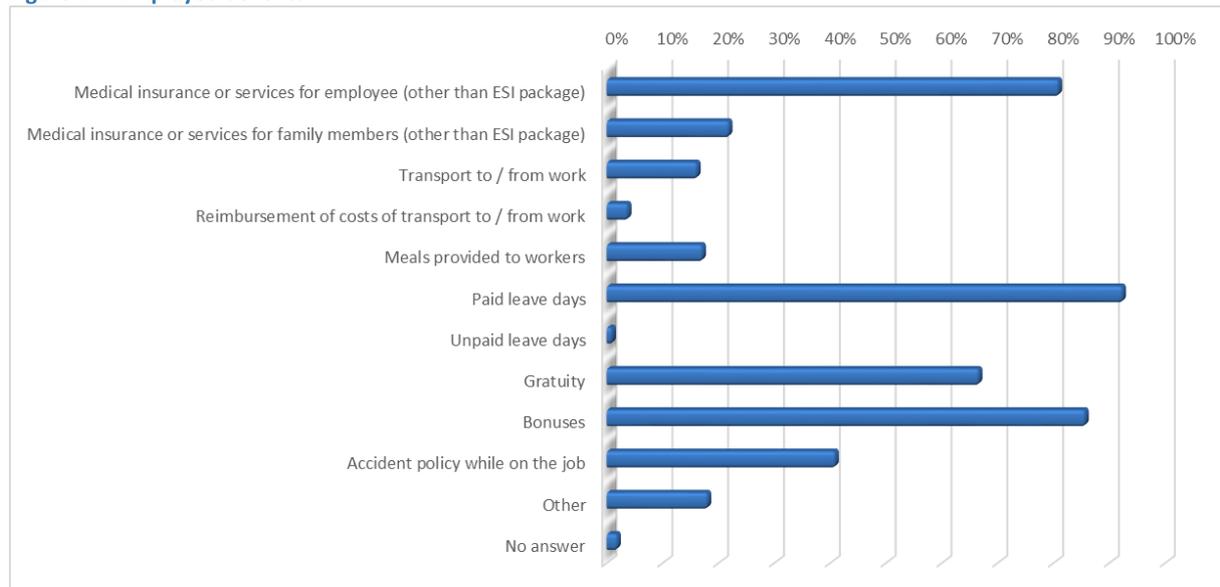


Figure 14 shows that three benefits were the most common: medical insurance or medical services for employees, bonuses and paid leave days.

Four out of five respondents indicated that the company offered medical insurance or medical services for employees. Table 50 in Appendix 2 shows that the share was higher in larger companies than in small companies. Though the question clearly asked about for medical insurance or services other than the Employees' State Insurance (ESI) package⁴, it is likely that the respondents did not make a difference between the insurance for employees earning more than the maximum ESI amount and employees that take part in this scheme. Under the ESI scheme, both the insured employees and their dependents are entitled to medical treatment. However, offering medical insurance or medical services to family members was not very common among the participating companies: just over one in five companies reported this benefit, though the share is a lot higher among medium-sized and large companies than in the smaller ones.

According to the respondents, employees in their companies had on average 25.5 leave days. Legally (i.e. according to the Factories Act), employees are entitled to 1 paid leave day for every 20 days of work, amounting to maximum 12 paid leave days per year. However, according to an article on www.dnaindia.com, employees get on average 18 paid days of leave⁵. In addition to this, there are three public holidays during which all employees are off (i.e. January 26(Republic Day), August 15 (Independence Day) and October 2 (Mahatma Gandhi's Birthday)) and several holidays that are not observed throughout India. It is plausible that the average number of paid leave days mentioned in this survey, includes national and regional public holidays, but may still be higher than the legal minimum.

⁴ The Employees' State Insurance is a social security and health insurance scheme for Indian employees earning wages of INR 15,000 per month or less. Considering the type of work in the companies that participated in this survey, it is very likely that many employees of the participating companies are obliged to take part in this scheme.

⁵ See www.dnaindia.com/mumbai/report-53-indians-feel-paid-vacation-time-given-to-them-not-fair-2013573 (retrieved on 1 November 2015)

Other employee benefits that were mentioned by a relatively big share of respondents were bonuses (86%) and gratuity (67%)⁶. Less common benefits were transport to and from work (and especially reimbursement of transport costs) and the provision of meals. Only one company offered unpaid leave to its workers. Two out of five employers mentioned having an accident policy for workers while on the job. However, this is not so much an employee benefit, but part of the operational management strategy of the company.

One out of five respondents mentioned “other benefits” (see Table 53 in Appendix 2). These other benefits involved mostly arranging accommodation to employees, support in education (for the employee or for his or her children), other insurance of employees, and the provision of uniforms and safety gear. Just like having an accident policy for workers while on the job, the provision of uniforms and safety gear would not be an employee benefit, but part of operational management of the company.

The figures on employee benefits are broken down by sub-sector in Table 49 and by company size in Table 50 in Appendix 2. The figures show that there were not so many differences between the sub-sectors, except for companies that are part of the unorganised sector, where the number of employee benefits was limited, which is in line with the nature of the company. The company size has a strong effect on the employee benefits that are offered: the bigger the company is, the more benefits it offers to its employees. This may be because large companies are legally required to offer more benefits than smaller companies, but also because large companies generally have more professional human resources departments than smaller companies.

The overall majority (80%) of companies made provident fund payments for their employees (see Table 52 in Appendix 2). One in ten companies did not answer this question and the remaining 10% did not make provident fund payments. Table 52 shows that the companies that did not make these payments are mostly micro-sized and small companies, while almost all (except for one) medium sized companies and large companies did. Though some respondents were not sure about the amounts they paid into the provident fund, the majority (72 out of 84 companies that made provident fund payments) mentioned paying 12% of the total salary, which is in line with regulations.

Contractors are responsible for the financial package and other benefits for contract workers. However, if contract workers work side by side with regular employees, but receive very different pay and benefits, the atmosphere on the shop floor may be negatively affected. That is why some companies also offer services and extras to contract workers. Participants representing 55 companies with contract workers were asked about these services and extras for contract workers and their responses are listed in Table 54 in Appendix 2. Like the benefits of regular employees, medical insurance or medical services, and paid leave days are mentioned by the majority of the respondents as benefits for contract workers, which is not in line with expectations because medical insurance (65%) and paid leave days (75%) would typically be the responsibility of the contractor. This is an indication that the question may need to be rephrased in a future survey on this subject. Other benefits companies mentioned for contract workers are bonuses (69%) and gratuity (31%).

Going rates for the most common job roles

Employers are generally hesitant to share information about the remuneration of their employees. That is why respondents were asked what wages / salaries they would offer to recruit new employees or to hire contract workers for the most common job roles. Respondents gave a minimum

⁶ Gratuity is a statutory benefit payable by employers (directly or via an insurance) to employee after 5 years of continuous full time service.

amount and a maximum amount for each job role, both for permanent employees and for contract workers. The results are presented in Figure 15 and in Table 51 in Appendix 2.

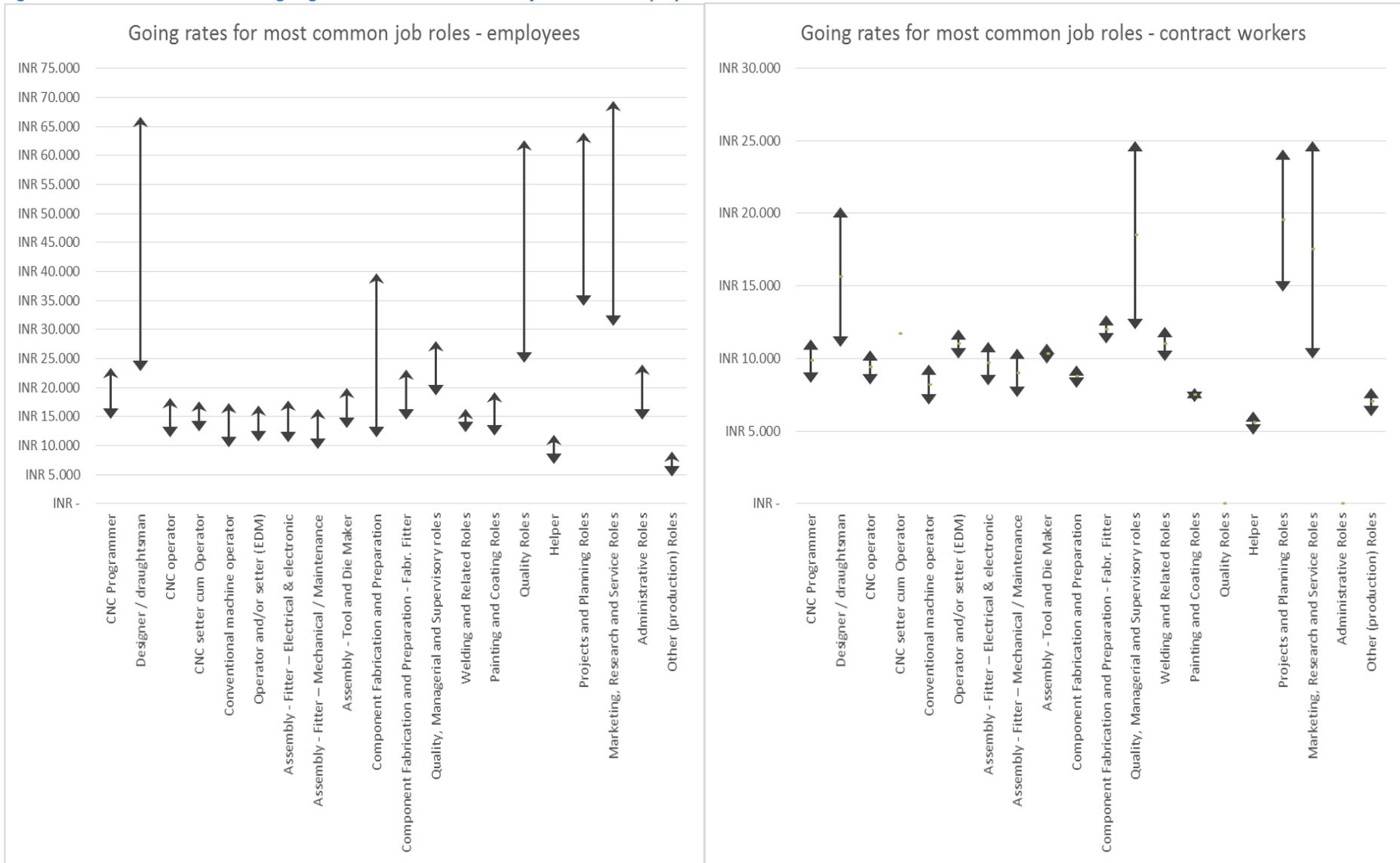
Respondents have given minimum and maximum rates for employees in 470 of the total of 584 job roles that were mentioned (see paragraph 4.2). For contract workers, 59 respondents mentioned a minimum and maximum rate.

Looking at Figure 15 and at Table 51, it is immediately clear that the rates for permanent employees are much higher than for contract workers, both for the average minimum fees that were mentioned and for the maximum fees. Also, the figures show that contract workers are not hired for certain job roles, for example for quality roles and administrative roles. During the interviews, some respondents explained that contract workers were especially hired for relatively simple jobs and that contract workers did not need to have experience, justifying a lower rate. This would explain the lower minimum and maximum rate for contract workers. Also, respondents stressed that jobs in which strategic information about the company is used or produced, are generally not done by contract workers, which could explain why no fees for contract workers are mentioned for quality roles and administrative staff.

Figure 15 clearly shows that the range between the minimum and maximum rate for employees is much larger for some job role categories than for others. For example, for categories like designer/draughtsmen, quality roles, projects and planning roles, and marketing, research and service roles, the *difference* between the minimum and maximum monthly rate varies from almost INR 30 thousand to well over INR 40 thousand. For employees in welding and related roles, helpers, and CNC setter cum operator roles, the range is much smaller, varying from INR 4 thousand to just over INR 5 thousand. This suggests that the first mentioned group of job role categories offers potential for professional growth, while employees in the second group of job role categories have less room for growth.

Lastly, the average monthly rate for the production role category “component fabrication and preparation” is much higher than for the other production roles. This can indicate that there is a longer career path for workers in this job role, but might also be an indication of a shortage of capable workers for this job role category, forcing employers to offer higher wages.

Figure 15 - Minimum and maximum going rates for the most common job roles for employees and contract workers



4.7 Technical information on CNC setters cum operators and on Fitters-Fabrication

After the interviews about human resources practices, the interviewers had a separate meeting with one or more shop floor managers to discuss their experience with CNC setter cum operators and with fitters-fabrication in more detail. The questions for this meeting have been prepared in collaboration with the capital goods expert of the project, who will use the information as input for the development and/or evaluation of curricula for these job roles.

For each job role, shop floor managers have been asked about the number of employees, their educational backgrounds, the level of their skills, and also whether companies organise training for the staff in these fields. Also, more detailed information has been collected about a range of skills, more specifically a rating of the current work force, a rating of graduates in this field, and the importance of these skills for the company. The results are presented separately for each job role in the paragraphs below.

CNC setter cum operators and related job roles

Representatives of 53 companies have answered questions about staff working in CNC operator, setter or programmer positions. In total, they mentioned 94 positions (see Table 55 in Appendix 2), of which 19 (20%) CNC operators, 28 (30%) CNC operators / setters and 34 (36%) CNC programmers and 13 (14%) other job roles in the same field. On average 8.3 employees would work in each CNC related job role, but this number is much higher for CNC operators and CNC operators / setters, i.e. 12.7 and 12.8 operators respectively. The participating companies employed 3.4 CNC programmers on average.

The majority of CNC operators and CNC operators / setters had an ITI or CGSC certificate, i.e. 79% and 71% respectively (see Table 56 in Appendix 2). Two respondents reported that their CNC operators had a lower education background (i.e. class 10-12) and two employed CNC operators with a diploma level background. For CNC operators/setters, 5 respondents had employees that finished education at class 8 – 12, and three at diploma level. CNC programmers generally had a higher education level: more than half of the respondents reported that the education background of CNC programmers was at diploma level and 38% reported that their CNC programmers would have an ITI or CGSC certificate. On a scale of 1 to 5, the shop floor managers rated their CNC operators, operators/setters and programmers at 3.4, 3.6 and 3.7 respectively, which means that they are generally satisfied with their staff in these positions, but that there is room for improvement. The 9 respondents that have staff working as CNC operators/setters/programmers are most satisfied with the skills of their workers, rating them at 4.1 on a scale of 1 to 5. Considering that these employees combine the skills needed for three different job roles, this is not surprising. In fact, it is in line with the reported wish of the respondents for workers that can work in more than one area (see page 44).

Practically all respondents (98%) mention that they send their staff working as CNC setter-cum-operator or in related job roles for training (see Table 57 in Appendix 2). In line with the previously reported finding on training type (see page 45), informal on-the-job training was most common: this was used by 96% of the respondents. Also popular was a non-formal / structured training programme in the company, which was used by a third of the respondents. Only 4 (8%) respondents worked with official apprentices and 6 (12%) of the respondents offered their employees formal training by an outside provider, e.g. by an ITI/ITC or private provider. The duration of training (see Table 58 in Appendix 2) varied: in a third (i.e. 6) of the companies, CNC-operators were trained for a period of up to a week, 22% (i.e. 4) respondents trained workers in this job role between a week and a month and 28% (i.e. 5) trained them between three and five months. CNC operators/setters were generally trained a bit longer: in a quarter (i.e. 7) of the companies, these workers were trained

between three and five months and 29% (i.e. 8) even for more than a year. In ten of the participating companies (29%) CNC programmers were trained for three to five months and in 8 companies (24%), workers in this job role were trained for up to one week. Five companies (15%) trained CNC programmers for more than a year and a similar number trained them for 1 week to 1 month.

Figure 16 and Table 59 in Appendix 2 contain the rating of skills and knowledge of the current workforce in CNC positions and of graduates in this field. Also, the importance to the company is rated for each item.

Figure 16 shows that on all the items, respondents rated their workforce at 3.2 or higher (on a scale of 1 to 5), while graduates were rated at 2.9 or higher. The distribution of the scores on the items is strongly skewed towards the right and the variance (not mentioned in the table) is rather small. In short, the items do not have a statistical “normal distribution”. Though respondents did report several issues when dealing with training providers (see page 45 and 46), the distribution of the ratings indicates that respondents were quite satisfied with the skills and knowledge of their workforce and of the graduates. An explanation can be that the training in the field of CNC is sufficient, but that the reported issues concern other fields. Alternatively, respondents may have found it difficult to criticize their team-members and interns and would therefore give a score of 3 or above, which would be a “social desirability bias”

Comparing the scores of the different items, it seems that there would be room for improvement for the skills of the workforce in their “use of shop mathematics” (average score 3.2) and to a lesser extend in the “use of hand tools” and “CNC G & M codes” (both have an average score of 3.5) and in “interpreting engineering drawings” and “CNC canned cycles” (each scored at 3.6 on average).

Only few respondents had direct experience with employees that recently completed an education or training in the field of CNC. Those who did, rated the skills of the current workforce generally higher than the skills of the graduates, which is not surprising as the latter group does not have as much experience as the current employees. Only the skill “use of shop mathematics” is rated higher for graduates than for the current workforce and the skill “interpreting engineering drawings” is rated almost equal for the current workforce and for graduates. This finding supports the remark above that these two skills among the current workforce may need to be improved. For training and education providers, the findings suggest that more attention should be given to “CNC G & M codes” (average score of 2.9). And with an average score of 3 (albeit by a limited number of respondents), training and education might be improved on “use of hand tools”, “CNC vertical machining centre setup”, “CNC vertical machining centre operation” and “CNC canned cycles”.

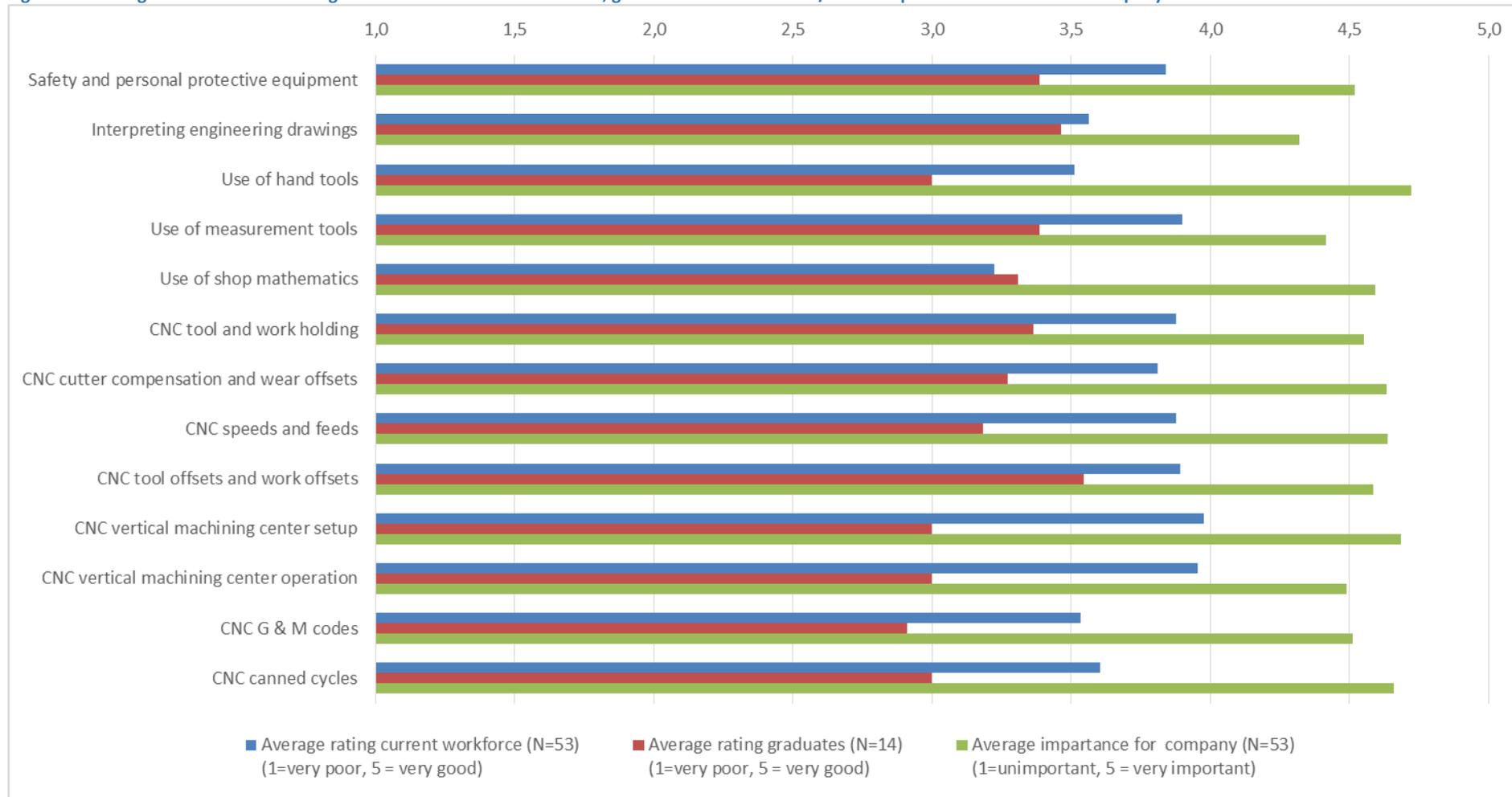
All items in the questionnaire were considered “important” for the company: on a scale of 1 to 5, the average score varied from 4.3 to 4.7.

Additional remarks on about the skills and knowledge of the current workforce in CNC positions and graduates in the field of CNC, as well as the importance to the company are listed in Table 60 in Appendix 2.

[Fitters fabrication and related job roles](#)

Representatives of 24 companies responded to questions about staff working in fitter-fabrication positions. In total, they mentioned 56 positions (see Table 61 in Appendix 2), of which 15 (27%) welders, 12 (21%) fitters-fabrication and 7 (13%) fitters/welders. Sub arc operators, welders fitters and welder/fabricators were each mentioned 5 times (i.e. 9%), and other job roles in the same field were mentioned by 7 companies (i.e. 12%).

Figure 16 - Rating the skills and knowledge of staff in the field of CNC work, graduates in this field and/or the importance of this for the company



On average 12.2 employees worked in these job roles, but this number is much higher for welders-fitters (23.8 employees). The number of welders is also above average (12.7 employees), while the average number of employees is lower for the other job roles.

The overall majority of the respondents mentioned that employees in the fitter-fabrication job roles had an ITI/CGSC certificate. Only some respondents mention lower educational achievements for their staff in some job roles, for example, 3 out of 11 mention that their fitter-fabrication had finished class 10-12 and half of the fitters/welders had finished class 8-10 or class 10-12. As for the rating of the skills, shop floor managers rated their staff in the fitter-fabrication job roles between 3.5 and 4 on a scale of 1 to 5.

All 24 respondents mentioned that the company's staff working in fitter-fabrication job roles were trained (see Table 63 in Appendix 2). As is the case for the CNC operator/setter/programmer job roles, informal on-the-job training was most popular: it was used in all participating companies. Seven respondents (29%) used a non-formal / structured training programme in the company and only 2 (8%) worked with official apprentices. The duration of training varied (see Table 64 in Appendix 2), but generally about half of the respondents trained their fitter-fabrication staff for 1-2 months or 3 to 5 months, and about a quarter of the respondents trained their staff for up to 1 month.

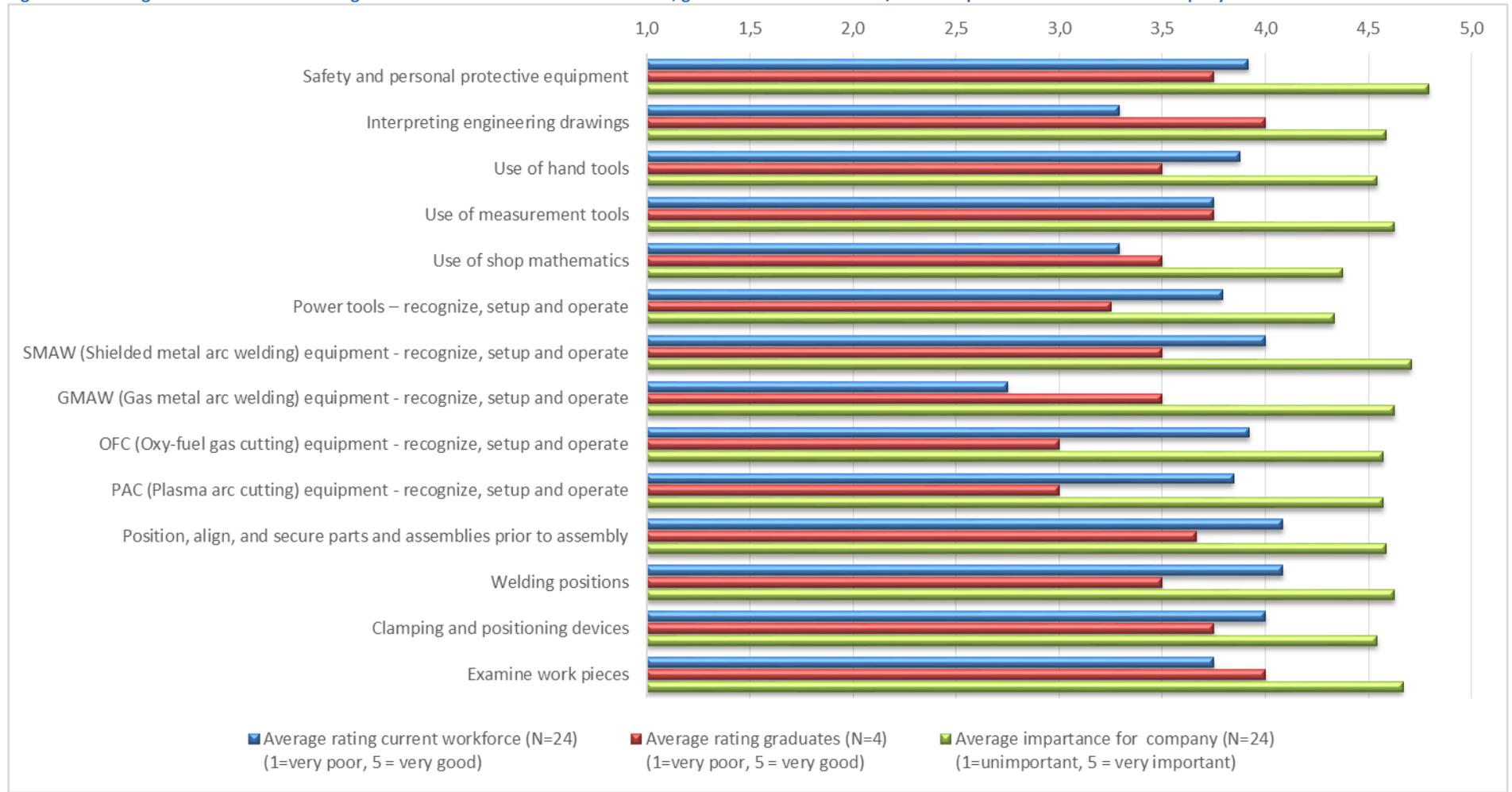
Figure 17 and Table 65 contain the rating of skills and knowledge of the current workforce in fitter-fabrication positions and of graduates in this field. Also, the importance to the company was rated for each item. Similar to the rating of skills and knowledge of CNC operators/setters/programmers, respondents rated their fitter-fabrication workforce relatively high. Only one item, "GMAW (Gas Metal Arc Welding) equipment - recognize, setup and operate", is rated at 2.8 on a scale of 1 to 5. The other ratings were all 3.3 or higher. As explained above, this can mean that the respondents were just satisfied with their workforce or that they found it difficult to criticize their team-members, giving them a score of 3 or above, which would be a "social desirability bias".

Comparing the scores of the different items, it seems that there is room for improvement for the workforce in the above-mentioned skill "Gas Metal Arc Welding equipment - recognize, setup and operate", and to a lesser extent in "interpreting engineering drawings" and the "use of shop mathematics". The average score was 3.3 for each of the latter two items.

Very few respondents (i.e. 4) had direct experience with employees that recently completed an education or training for fitter-fabrication. However, the ones that did, gave graduates a higher rate on some of the items. The rating of graduates for interpreting engineering drawings was 0.7 point higher than for the workforce. For "Gas Metal Arc Welding equipment - recognize, setup and operate", the difference was also 0.7 point, but this is based on the scores of only 2 respondents. A smaller difference of 0.2 in favour of graduates is found for the skills "use of shop mathematics" and "examine work pieces". On the other hand, the skills and knowledge of the workforce are rated higher for welding positions (a difference of 0.6). The difference (in favour of the workforce) for "Oxy-Fuel Gas Cutting equipment - recognize, setup and operate" and "Plasma Arc Cutting equipment - recognize, setup and operate" is 0.9 and 0.8 respectively, but the average rating of graduates on these items is based on the answers of only two respondents, which means that the actual difference in skill and knowledge of workers and graduates may be smaller. If necessary, this can be investigated further in future studies in this field.

Similar to the items about the skills and knowledge of CNC operators/setters/programmers: all questions about the skills and knowledge of fitters-fabrication were considered "important" for the company: on a scale of 1 to 5, the average score varied from 4.3 to 4.8.

Figure 17 -- Rating of the skills and knowledge of workers in field of fitter fabrication, graduates in this field and/or the importance of this for the company



Additional remarks on about the skills and knowledge of the current fitters-fabrication workforce and graduates in this field, as well as the importance to the company are listed in Table 66 in Appendix 2.

Changes in number of workers

The final question for the shop floor managers was whether the number of workers in CNC operator/setter/programmer and fitters-fabrication would change in the years to come. If so, respondents were asked to specify the size of the change. In Table 67 in Appendix 2, their answers are listed. The table show that the respondents were in a very positive mood: they all expected that the number of workers in all job roles would increase or remain the same. More precisely, half of the respondents expected an increase and the other half expect the number of workers to remain the same.

The average increase would be especially big for CNC setters, welder-fitters, CNC operators and welders. The total number of CNC operators was expected to increase the most (9 respondents expecting an increase of 13 workers on average), followed by welders (6 respondents and an average increase of 10.8), welder-fitters (3 respondents expecting an increase of 21 on average) and CNC programmers (12 respondents expecting an increase of 5.1 on average).

Considering the limited number of respondents, the reported expectations may be indicative for what was expected for the work force in the participating companies and not for sector wide developments in Maharashtra for which further (econometric) research will be required.

5 Conclusions and recommendations

Considering that this labour market analysis was a pilot study and that the participation in the survey was limited (see paragraph 3.2), the findings in this survey may not be representative for all capital goods producing companies in Maharashtra. However, the labour market analysis has contributed to clarifying a number of issues.

The findings and recommendations presented below are not necessarily new and may have been anecdotally stated in different forums in the past. In contrast, the current findings and conclusions are primary and evidence-based (i.e. not on based on assumptions), and express the views of a range of companies from different divisions in Maharashtra, from different sub-sectors and of different company sizes. The study provides proof of and further details on selected issues and constraints related to the demand and supply of labour in the capital goods sector in Maharashtra.

This last chapter contains the conclusions and recommendations that can be based on the findings reported above. In the next paragraphs, the main findings and conclusions for each subject are briefly discussed, followed by one or more recommendations.

5.1 Set up a system for labour market analysis

Findings and conclusions

Labour markets are not always predictable and are influenced by many internal and external factors. There are important differences between companies in different sub-sectors, regions, company sizes and other characteristics of companies. For example, in this survey, the mood in companies in the unorganised sector was much more negative than in other sub-sectors. And though many companies were not happy about the economic situation at the time, the total size of the workforce of the participating companies had increased, suggesting an increase in productivity. Understanding the reasons behind these findings requires a qualitative labour market analysis rather than econometric forecasting models. This is also the case for subjects like skill problems, retention and recruitment problems, recruiting women and persons with disabilities for specific job roles, etc.

Recommendations

The traditional manpower planning approach differs from the qualitative methodology used in this survey. Qualitative labour market analysis, or labour market signalling, implemented on a regular basis, is more useful as a means of informing policy makers and other stakeholders on labour market developments. It would be good if a system were adopted that is sensitive to fluctuations and differences in the labour market and that would help to understand unexpected changes, differences between sub-sectors, company sizes and regions, etc.

5.2 Active involvement in future labour market analyses

Findings and conclusions

Convincing representatives of companies to take part in the survey was difficult, whereas having access to employers is key to any labour market analysis. Due to circumstances, little time was left prior to the survey to approach companies to “test the water”, which was why the active support of the CGSC representatives during the first week of the survey was essential in arranging appointments for interviews with a number of large sized enterprises. During the following weeks of the survey, the project and the interviewers had to take up this role, which was time consuming and not always successful. In the final stages of the survey, local representatives of CGSC member associations in

Aurangabad and Nashik have helped convincing companies to take part in the survey, and as a result, the response rate of companies in these divisions increased significantly.

Despite these efforts to convince companies to participate in the survey, the number of companies that took part was less than the experts had hoped. This means that generalising the findings of the survey can only be done very carefully. Secondly, though more companies will now know of the existence and the role of the CGSC, and how the CGSC relates to the sub-sector associations they are a member of, the survey could have been used more as a marketing instrument for the CGSC to increase the awareness of the companies in this field.

This LMA for the demand side should ideally have been complemented by an analysis of the supply side, e.g. obtaining data and opinions from training institution principals, teachers and students. However, the survey budget did not allow for these additional activities, which is why the information and views presented in this report are based on the responses of the 105 participating companies and to a certain extent on additional information received from selected key informants.

Recommendations

CGSC and/or its member associations could consider to not only conduct regular labour market analyses on different subjects and in different states, but to also play an active and leading role in the design, implementation, analysis and reporting and to not leave it to an outside consultant. . This would increase the CGSC's own knowledge and understanding of the sector, and it would also be an excellent way to use the surveys to increase the visibility of the CGSC in the sector and, if possible, to further build up the CGSC's network of companies.

5.3 Determine the size of the unorganised sector

Findings and conclusions

The small number of unorganised sector companies taking part in the survey could mean that the sector is highly organised, but it is also possible that the chosen approach to identify unorganised sector companies was not appropriate. Considering the impressive size of the unorganised sector in India, it is very well possible that unorganised sector companies are considerably under-represented in this survey.

If the capital goods sector is indeed highly organised, it would make sense to only target organised sector companies when designing and implementing skill development programmes and recognition of prior learning initiatives. However, if the number of unorganised sector capital goods producing companies and the number of persons these companies employ is not negligible, the design of these programmes and initiatives would need to be adjusted to the needs of the unorganised sector companies and their workers. This is especially the case for recognition of prior learning initiatives, as many workers in the unorganised sector do not have official qualifications but acquire knowledge and skills on the job.

Recommendations

At the moment, there is no statistical data on the share of unorganised sector companies in the capital goods sector and the number of workers these companies would employ is unknown. Therefore, it is recommended to establish the number of unorganised sector companies producing capital goods and their number of employees through further research, and to use this information when designing and implementing future activities in skill development.

5.4 Use the information about the most common job roles

Findings and conclusions

As mentioned in the report, the 105 respondents have mentioned 584 job roles being present in their companies. As similar job roles can go by different names (for example, fitters-fabrication are likely to do the same work as fabrication-welders or fitters-welders, etc.), the 584 job roles have been recoded into 46 job role names. Coding has been based on the descriptions given by the respondents and as much as possible in line with the NOS/QPs developed by the CGSC. Because 46 job role names give too much detail for an analysis of the workforce in the participating 105 companies, the job role names have been merged into 20 job role categories, using the occupational map developed by CGSC .

Recommendations

A closer look is advised at the coding of the job roles into job role names and job role categories. This information may be relevant when the NOS/QPs are updated. Depending on the share of unorganised sector companies in the capital goods sector (see the previous paragraph), consulting with organisations representing the unorganised sector is advised to understand how the job roles in these companies differ from the organised sector and to find out what support would be needed to assist unorganised sector companies in improving their skills base.

5.5 Recruitment and selection

Findings and conclusions

- A. Companies consulted during the survey use many different recruitment methods and selection criteria. There was a strong preference for informal recruitment methods, but this preference was especially strong among unorganised sector companies and small companies with up to 50 employees. Medium-sized and larger companies used more formal ways of recruitment. Almost none of the companies recruited via employment exchanges. Selection criteria also differed in companies of different sizes. Having a certificate, diploma or degree was not considered important in the unorganised sector companies, but having work experience was. In bigger companies, respondents used (written or practical) tests and references from previous employers, which was not the case for small and medium-sized companies. The behaviour of the potential employee during the interview was into account by companies of all sizes.

The strong preference for informal recruitment methods is a common feature for recruitment worldwide. In many countries, this has led to government employment agencies shifting their focus from placement-related services to active labour market measures. In other words, employment services move away from simple matching support towards offering career guidance, support to establishments, especially for small enterprises, and tailor made training for specific target groups. In these fields, public employment services often face competition from private organisations offering (part of) these services.

- B. Smaller companies preferred recruiting underqualified workers and larger companies preferred people with the right qualification. This may be because the limited number of workers in smaller companies implies that the job roles will be more general while the larger companies can afford to have more specialised positions among their staff. Yet representatives of smaller companies also mentioned that workers were keen to work for larger companies, so recruiting (and training) underqualified staff by smaller companies could be a way to control labour costs and to secure their labour force. This information would need to be taken into account when developing initiatives concerning recognition of prior learning.

- C. Just over half of the participants would consider recruiting women for one or more of the common job roles and 30% would consider recruiting persons with disabilities. In the unorganised sector, reluctance to recruit women and persons with disabilities was highest. Respondents mentioned that 18% of the most common job roles would be open for women and 8% for people with disabilities. Job role categories mentioned most for women were designer / draughtsman, CNC Programmer, CNC (setter cum) operator, and Quality, Managerial and Supervisory roles. Job role categories mentioned for disabled people were CNC Programmer, designer / draughtsman and CNC operator.
- D. A third of the companies recruited employees locally and almost half of the company representatives recruited throughout India. Respondents highlighted that anyone is welcome to work as long as they are willing to move to the base of the company.

Recommendations

- A. Public and private organisations offering employment services would need to focus especially on offering services to job seekers (like career guidance) and to companies (in recruitment and selection). They might want to target small companies specifically, as these reported more retention problems and a higher number of vacancies on the one hand, but were very positive about the economic developments and expected their workforce to grow on the other hand.

The information collected during labour market surveys and through other research should be used as a tool in providing information about the different job roles in the sector for career guidance purposes by relevant organisations.

- B. When developing recognition of prior learning initiatives, take the recruitment and retention strategy of small companies into account: recognition of prior learning should not increase the apprehensions of employers that the employees may leave after getting an official qualification.
- C. Labour market shortages might be targeted by considering workers that are currently a minority in the sector, i.e. women and persons with disabilities. It might be good to conduct a more in-depth study on how the companies might be willing to do this and if and what changes are needed in the companies to realise this.
- D. Though companies are generally willing to recruit from all over India, it would make sense if the planning of education and training takes the local demand for labour into account.

5.6 Supply of labour for common job roles

Findings and conclusions

Higher turnover and recruitment and skill problems were reported especially for the most common job role category CNC operator. Fewer, but still more than average problems were mentioned for tool and die makers, conventional machine operators, welding and related roles and for marketing, research and service roles. Unfortunately, respondents also expected the demand to increase in the year to come for four of these five job roles categories (i.e. CNC operators, tool and die makers, conventional machine operators and welding and related roles).

The most reported recruitment problem is non availability of suitable candidates in the labour market, followed by candidates not having the right technical skills and knowledge. A few companies mentioned that the candidates lack soft skills like creativity and problem solving skills.

Recommendations

Workers active as CNC operators, tool and die makers, conventional machine operators and in welding and related roles seemed to be in short supply in the labour market. Also the demand for workers in these job roles is likely to grow. Though the rates paid for employees in these job roles are not exceptionally high, it would make sense for private and public training providers to concentrate on training for these job roles, using up to date curricula that are in line with the relevant NOS/QPs.

5.7 Role of companies and training providers in education and training

Findings and conclusions

About half of the respondents reported about expected changes in the skills required from the workers. Changes in skill requirements were especially expected among companies producing light engineering goods and machine tools, companies in Konkan division, and in small companies (i.e. 10 to 49 workers). The nature of the expected changes in skill requirement varied. Some respondents mentioned very practical and concrete skills like machine operating, designing and fitting, etc. Of course these are not new skills for the sector, but may be new for the company in question. Technical skills and knowledge were mentioned as well, especially the ability to understand engineering drawings. Also, respondents reported that they would need their workers to combine different skills rather than the skills for one specific job role only.

In all companies, and especially in the unorganised sector, the vast majority of training is provided on the job. About a third of the companies offered structured training programmes in the company and an almost 30% offered formal training by an outside training provider.

The relationship of companies with education and training providers, involved mostly recruitment activities, traineeships/apprenticeships and company visits of students to the company.

Several companies reported that new workers generally lacked practical skills. They would like education and training providers to teach students about the latest technology and have “practice oriented” courses, allowing students to develop skills and knowledge that are in demand in the companies.

Recommendations

- A. Considering companies’ need for workers with more practical skills, collaboration between companies and education and training providers in offering additional practical skills through apprenticeships, internships and other short training programmes needs to be encouraged.
- B. For some more specialist training the utilisation of company facilities and equipment would be more efficient and useful than procuring additional facilities and equipment for the training centres. Policy makers could consider incentives for companies and training providers to participate in such schemes. The initiative to establish this collaboration would need to come from training providers rather than expecting companies to initiate this.
- C. Ministries and other organisations directly involved in vocational education and training may review the handling of equipment and tools in their training centres and ensure that the practical

elements of the curricula are implemented as planned and/or are improved.

- D. As employers mentioned that they will require several new skills and technical knowledge, training providers could play a more active role in the upgrading of skills of the current workforce. They could organise tailor-made training for companies and actively approach companies to discuss opportunities to collaborate. Of course, the exact content of the trainings would need to be based on a detailed needs assessment at local level.
- E. Lastly, shop floor managers have been asked in detail about their experience with CNC setter cum operators and with fitters-fabrication, both regarding the current workforce and workers that recently obtained a certificate or diploma. The information will be used to evaluate a curriculum developed for these two job roles by the project. It is recommended to repeat this for updated or newly developed NOS/QPs-based curricula for other job roles as well – either as part of a new labour market analysis or as a separate enterprise survey.

5.8 Career paths

Findings and conclusions

The sizes of the participating companies varied substantially, as did the composition of their workforce. Workers in large companies had a higher degree of specialisation, while job roles in smaller companies were often more generalist by nature. Of course, this would make economic sense for companies but a high degree of specialisation can have disadvantages for employees: it could reduce workers' chances for moving up the career ladder, unless the company has a suitable training programme to help employees progress through the ranks. Career prospects in smaller companies will be limited due to the generalist nature of job roles, which means that career prospects of employees in smaller companies will be limited as well.

As always, there are exceptions to the above-mentioned. For some job roles, the range between the minimum and the maximum wages for employees is much larger than for other job roles. For example, for categories like designer/draughtsmen, quality roles, projects and planning roles, and marketing, research and service roles, the difference between the minimum and maximum monthly rate is substantially larger than for employees in welding and related roles, helpers, and CNC setter cum operator roles, the range is much smaller. This suggests that the first mentioned group of job role categories offers potential for professional growth, which is hardly the case for employees in the second group of job role categories have less room for growth.

Recommendations

The Occupational Map of the sector (Consultants Progience & GlobalPeers, 2014) developed by CGSC is indicative of the vertical and horizontal career progressions. This must be fully utilised by the training system to counsel the trainees on potential careers, and when developing curricula, both for public and private training providers. Also, companies with a high number of specialised job roles could use career progression as a retention strategy in their human resources management strategy.

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