# STUDY OF SKILLS NEEDS IN THE WOOD PROCESSING SECTOR IN KOSOVO

SPECIAL FOCUS ON WOODWORKING-MACHINE TOOL SETTERS AND OPERATORS

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**Author: Dr. Artane Rizvanolli**

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Contents

## List of Abbreviations

| | |
|---|---|
| **CNC** | Computer Numerical Control |
| **EARK** | Employment Agency of the Republic of Kosovo |
| **GVA** | Gross Value Added |
| **KAS** | Kosovo Agency of Statistics |
| **MEST** | Ministry of Education, Science and Technology |
| **MLSW** | Ministry of Labour and Social Welfare |
| **VTC** | Vocational Training Centre |



## 1. Introduction and methodology

Wood processing is among the most successful manufacturing industries in terms of import substitution, and it is a sector which has experienced continuous growth in recent years. As such, it is considered as one of the sectors with high potential for growth, employment generation and export in Kosovo (e.g. MTI, 2014; MTI and UNDP, 2014, 2015; USAID, 2015a). However, skills shortages are reported by enterprises operating in the sector and there is a consensus that the level of workforce skills is one of the key barriers for the sector's further development, and this is becoming more important as the need to adopt new technologies and meet local and export market demands for higher quality products is increasing (MTI and UNDP, 2014; USAID, 2015a, b; EYE, 2016).

The level of workforce skills has been identified as a barrier to private sector; accordingly, the quality of education and links of education with labour market needs, with a particular focus on vocational education, are recognised as key areas of intervention in key strategic documents of the Government of Kosovo. Accordingly, the Kosovo Education Strategic Plan (2017-2021) recognises the linkage of vocational education to the labour market and underdeveloped quality assurance mechanisms as key challenges (MEST, 2016). Similarly, the National Development Strategy (2016-2021) recognises matching workforce skills with labour market needs as a precondition for increased investments, employment, revenues and growth of existing enterprises, which would in turn be translated into higher economic growth and more sustainable development (OPM, 2016).

Against this backdrop, skills assessments for the wood processing sector have been conducted previously by UNDP (2016) and EYE (2016). UNDP (2016) provided an analysis of skills needs for 'Cabinet-makers and related workers' (Code 7522 in the International Standard Classification of Occupations ISCO-08) base on an enterprise survey. This occupation was chosen on the basis of it being the most prevalent occupation in the sector as reported by enterprises. The analysis by EYE (2016), on the other hand, was not focused on a specific occupation, but rather provided a general overview of demand/shortages of skills in the sector based on qualitative data, as well as the supply of skills.

This study contributes to the existing literature on skills needs for the wood processing sector in two ways. First, based on secondary data and a survey of some of the largest firms in the sector, it provides insights into sector-level trends with regard to enterprise growth and employment in different occupations. Second, it provides an occupation-specific analysis for an occupation which is deemed crucial for realising the potential of the sector. The findings of this study can be used by education and training providers and policy-makers in developing employability skills to match the existing market requirements. Further, the findings can be directly used to develop the occupational standard for Woodworking-machine tool setters and operators, thus supporting completion of VET occupational framework.

**The methodology** adopted in this study draws from previous literature/methodologies on skills needs in Kosovo (ALLED, 2016a, b; UNDP, 2016), as well as studies in other countries that, similar to this one, combine a sector- and occupation- level approach (e.g. see sector profile of the wood sector in Lithuania by MCVET, 2008). In line with the methodology developed by ALLED (2016a, b) **the study analyses demand and supply of sector skills** in the wood sector by bringing together information about employment and vacancies (demand for labour) and graduates coming from education (supply of labour). The analysis draws from: (i) previous studies; (ii) secondary data from the Tax Administration of Kosovo (TAK), Kosovo Agency of Statistics (KAS), Employment Agency of the Republic of Kosovo

(EARK), and Ministry for Education, Science and Technology (MEST); (iii) primary data collected through a survey of 65 enterprises operating in the wood sector; (iv) interviews with enterprise representatives and other key stakeholders.

The starting point for **the selection of the occupation** were findings of previous research in the area: Both UNDP (2016) and EYE (2016) find that employees skilled in operating machines, and particularly Computer Numerical Control (CNC) machines are an important requirement for the further development of the sector, and the latter further stresses lack of qualified staff for maintenance and repair of CNC machines as a problem faced by the sector. Upon ensuring that there are no standards of occupation approved by the National Qualifications Authority at the time this analysis was conducted[1], key stakeholders were consulted, including the Head of EARK, representatives of the MEST and academia. Apart from consensus among stakeholders on the relevance of this occupation for the development of the wood processing sector, the selection of this occupation fulfils another condition in terms of scope and relevance: Woodworking-machine tool setters and operators are expected to be needed/found across different sub-sectors and enterprises (regardless of enterprise size).

**The analysis for the selected occupation** 'Woodworking-machine tool setters and operators' occupation (ISCO 08 Code 7523) is based on the methodology previously developed and piloted by UNDP (2016) with inputs from ALLED. It draws mainly from the enterprise survey, with the findings being validated and augmented from in-depth interviews with two enterprises (one small and one medium-sized).

**The sample for the enterprise survey** was extracted from the TAK register of enterprises (2016). The study covered all manufacturing wood-processing activities as registered in the TAK database (see Table 1.1).

Table 1.1: Economic activities covered in the study

| NACE Code | | Economic activity |
|---|---|---|
| **16** | | **Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials** |
| | 16.10 | Sawmilling and planning of wood |
| | 16.21 | Manufacture of veneer sheets and wood-based panels |
| | 16.23 | Manufacture of other builders' carpentry and joinery |
| | 16.24 | Manufacture of wooden containers |
| | 16.29 | Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials |
| **31** | | **Manufacture of furniture** |
| | 31.01 | Manufacture of office and shop furniture |
| | 31.02 | Manufacture of kitchen furniture |
| | 31.09 | Manufacture of other furniture |

Given the focus of the study, larger companies were selected in the sample under the assumption that their representatives are more informed about the skills of the workforce, the skills needed for the occupation (including those related to more advanced technology), and the trends in terms of future skills needs and the overall development prospects of the occupation/sector. Accordingly, a size threshold of above 9 registered employees was imposed. All companies with above 10 registered employees in the TAK register (as of 2016) were selected in the sample, whereas the rest of the companies selected had 8-9 registered employees. It was expected, however, that the size threshold would be maintained this way because these companies may have grown in the meantime and/or they may have had more employees employed informally. Accordingly, the size of the enterprises that were ultimately surveyed ranges between 10 and 215 employees at the time of the survey.

Of these enterprises surveyed for the purpose of this study, 53 firms are small enterprises, i.e. employing between 10 and 49 employees, while the remaining 12 are medium-sized, i.e. employing between 50 and 249 employees. The most prominent activity among these firms is manufacture of furniture, the main products being fitted kitchens and bedroom furniture, followed by tables, chairs and garden/office furniture. Apart from furniture, wooden doors and windows are common products among these enterprises, followed by wooden floors, stairs and other wooden interior products.

Given the focus of the study, the objective was to interview people within enterprises who have experience in supervising employees and are aware of the current and desired tasks performed and skills needed among employees (currently and in the future). Accordingly, production supervisors were interviewed where possible (in around a third of the enterprises), followed by enterprise owners and directors (see Table 1.2)[2].

Table 1.2: Position of survey respondents

| Economic activity | Share of enterprises |
|---|---|
| Owner | 48% |
| Production/line manager | 31% |
| Director | 11% |
| Human resource manager | 5% |
| Other | 5% |
| **Total** | **100%** |

**The questionnaire of the survey** was organised in the following modules:

Module 1 contained questions related to firm characteristics including: a) Firm characteristics, namely information on economic activity; investments, exports, employment by gender, age, occupations; mode of employment (regular versus seasonal); difficulties in filling vacancies; training); detailed information for selected occupation (number of employees and distribution by gender, age and education); b) Questions related to expectations for future, with regards to employment, turnover, exports and investments; c) Vocational education and training aspects i.e. review of skills and training provision; and, d) Questions on status and areas of cooperation between the sector and labour supply providers.

Module 2 focused on the occupational-specific tasks for the chosen occupation. For each of the occupations specific tasks, included under ISCO-08 description for the concrete workers,

[1] A related occupation standard for the wood processing sector, "Interior design and wood technology" was developed by Ministry of Education, Science and Technology, however this was not approved by the NQA to date.

[2] It should be noted that the size of the enterprises in the sector and in Kosovo in general is relatively small and run as family businesses. Ownership and management, and different functions/positions of management, are often not separated.

enterprises were asked the following questions: if concrete workers currently perform the task, if they should do the task; if the relevance of the task will increase in the future. Moreover, enterprises were asked to list three main corresponding skills required to achieve the expected performance results. In addition, information on emerging skills needs and measures employed by businesses to address them was obtained. Module 3 covered the importance and workers' preparedness to accomplish generic skills and Module 4 incorporated background questions on major changes and innovations introduced in the interviewed businesses and their impact on the dominant occupational group.

The rest of this report is organised as follows. Section 2 provides information on recent developments in the sector and prospects for the future, demand for labour and supply of labour and skills development. Section 3 discusses the findings from the skills needs for the selected occupation of woodworking-machine tool setters and operators, with a special focus on the tasks performed and required specific and general skills. Section 4 provides some concluding remarks and recommendations.

## 2. Overview of the sector

### 2.1 Sector size

The reliability of figures on the size of the sector and the number of jobs it provides is limited, partly due to the high informality (e.g. Riinvest, 2013, on the prevalence of informality among formal enterprises). However, both official data sources (national accounts statistics and Tax Administration data, discussed below) and primary data collected by other stakeholders (donors, Government) suggest that wood processing is a growing manufacturing sector.

According to KAS national accounts statistics, although the sector accounts for less than 1 percent of total gross value added (GVA)[3] in the economy, the GVA of the sub-sectors covered in this study has tripled between 2008 and 2013 (Table 2.1).

Table 2.1: Gross Value Added (GVA) in manufacturing of wood products (in thousand Euros)

| NACE Code | Economic activity | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|
| 16 | Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials | 4,157 | 10,386 | 21,404 | 9,940 | 12,030 | 12,038 |
| 31 | Manufacture of furniture* | 1,695 | 3,163 | 1,926 | 4,300 | 8,423 | 5,309 |
| 16+31 | **Total wood processing sector** | **5,852** | **13,549** | **23,330** | **14,240** | **20,453** | **17,347** |
| | **Total GVA** | **3,290,837** | **3,458,881** | **3,687,117** | **3,944,864** | **4,167,016** | **4,435,509** |
| | **Share of wood processing in total GVA** | **0.2%** | **0.4%** | **0.6%** | **0.4%** | **0.5%** | **0.4%** |

*This includes manufacture of mattresses (31.03), however this is not expected to account for a large share of GVA.

Sources: Total GVA data from KAS (2017); Sector-level GVA from KAS (cited in EYE, 2016)

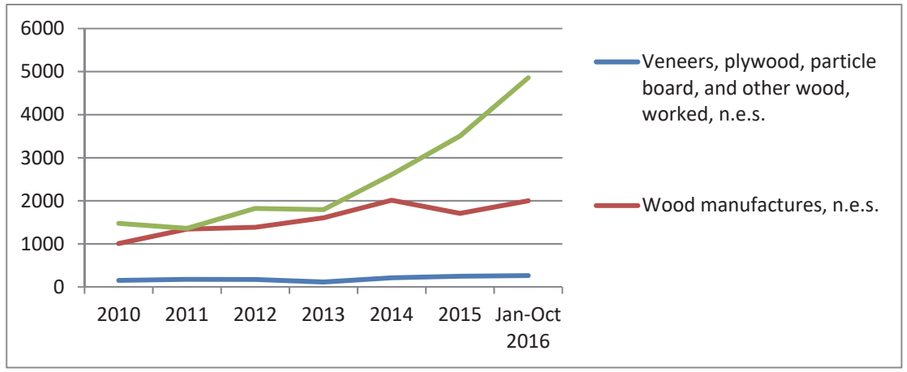
[3] Gross value added at basic prices equals output at basic prices, minus intermediate consumption at purchaser`s price.



Although the definition of the sector differs among different studies, various indicators point to a positive trend in the sector in recent years and a positive outlook for the sector in the future. USAID (2015a) based on interviews with some of the largest enterprise in the sector reports strong growth in recent years and opportunities for further expansion of the sector in both local and international markets, particularly for chairs, tables, kitchen cabinetry and wooden interiors. UNDP and MTI (2015) also suggests that there is potential increasing the sectors exports.

In 2015, Kosovo had a trade deficit of €79 million for manufactured wood products. However, positive trends can be observed with regard to external trade statistics for the sector. The value of exports has more than doubled from €2.64 million in 2010 to €5.46 million in 2015, and then it has reached €7.12 million in the first ten months of 2016 (see Figure 2.1)[4]. During this period, the ratio of exports to imports for manufactured wood products has increased steadily from 3.7 percent in 2010 to 6.5 percent in 2015 and 8.8 percent in the first ten months of 2016.

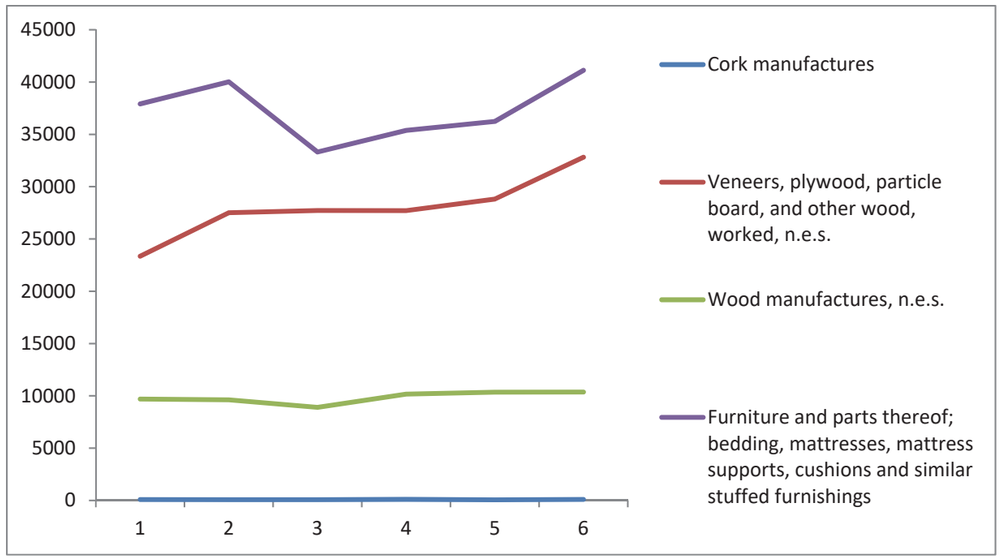
Figure 2.1: Exports of manufactured wood products and furniture




Imports have also increased over this period, though at a slower rate, from €71 million in 2010 to €84.4 million in 2015 (see Figure 2). During the period, imports of intermediate products (veneers, plywood, particle board, etc.) used by local producers for further processing have increased by 40 percent, whereas imports of furniture and parts of furniture (i.e. a group consisting partly of final products and partly of intermediate products such as mattresses, cushions, etc.) increased by 8 percent, which is in line with the explanation that local production and import substitution were increased during this period.

[4] Note that these figures include also external trade of mattresses and bedding.

Figure 2.2: Imports of manufactured wood products and furniture




Positive trends of the sector in recent years, potential for import-substitution and export, and donor-supported interventions aiming to enhance the competitiveness of the wood processing sector and promote exports provide expectations that the sector will grow in the coming years.

## 2.2 Employment

In 2016, there were 2,670 registered employees in the enterprises in the wood sector (registered in TAK) as defined in this report, which marks a significant increase of 23 percent compared to comparable figures for the end of 2012. However, these figures are likely to be significantly underestimated given the high level of informality[5]. The 65 surveyed enterprises alone employed 2,341 employees at the time of the survey, of which 17% were reported as seasonal employees.

Other sources based on enterprise surveys and interviews referring to total employment (i.e. including informal employment) also point to increasing trends of employment in the sector. E.g. MTI and UNDP (2014) find based on survey data that employment in the surveyed enterprises has more than doubled in 2012 compared to the previous years, whereas USAID (2015a) based on interviews with some of the largest enterprise in the sector reports strong growth and positive prospects for the period 2012-2017.

The average number of employees in the surveyed enterprises was 36, including seasonal employees. Table 2.2 below presents the prevalence of different occupations among the surveyed enterprises, though it should be noted that the results are not representative of the sector (see Appendix 1 for a list of key occupations in the sector). The surveyed enterprises reported at least one woodworking-machine tool setters and operator, and the other most prevalent occupations were cabinet-makers and wood product assemblers. However, the figures on the number of employees according to occupations should be treated with caution,

[5] In 2013, Riinvest estimated that in the manufacturing sector less than 55 percent of employees employed by registered enterprises were registered.



given that occupations in this sector in Kosovo do not tend to be as well defined as those in in the ISCO 08 classification based on analyses of tasks performed. For instance, while UNDP (2016) finds that the enterprises define 'cabinet-makers' as the main occupational group in that survey report that these employees perform a wider range of tasks than those foreseen in the ISCO 08 classification (i.e. selecting the proper wood/raw material for different purposes and preparing it; calibrating, inspecting and maintaining machinery). Similarly, in the survey conducted for the purpose of this study, enterprises indicate that woodworking-machine tool setters and operators also require skills to perform tasks beyond those tasks as foreseen in the ISCO 08 classification (e.g. assembling wood products, painting wood products, selecting the proper wood/raw material for different purposes, etc.).

Table 2.2: Employment in the sample according to occupations

| ISCO 08 Code | Occupation | Share of enterprises | Employees* | |
|---|---|---|---|---|
| | | | Average | Range |
| 7523 | Woodworking-machine tool setters and operators | 100% | 10.6 | 1-70 |
| 7522 | Cabinet-makers and related workers | 91% | 7.1 | 1-20 |
| 8215 | Wood and related products assemblers | 91% | 3.1 | 1-40 |
| 7115 | Carpenters | 55% | 5.3 | 1-20 |
| 7521 | Wood treaters | 9% | 3.0 | 1-8 |

**Average and range for firms that report employees of the occupation

The share of women employees in the surveyed enterprises is only 8.3 percent. Of these, over half are engaged in sales, administration and support activities (e.g. cleaning), and another 37 percent are engaged in production, which includes high-skilled professions such as engineers, designers, architects.

## 2.3 Demand for labour

### 2.3.1 Current demand for labour: Registered vacancies

There are no reliable data on the current and future labour demand in Kosovo. Statistics on vacancies (by sector) are available from the Employment Agency of the Republic of Kosovo, according to which the total number of identified regular vacancies in the wood processing sector by the public employment services during the same period was 141 (Table 2.3 below), while an additional 219 jobs were listed as a result of active labour market measures implemented by the Employment Agency (previously the Ministry of Labour and Social Services). However, generally, vacancy statistics must be treated with caution because public employment services do not manage to identify all vacancies for various reasons: enterprises do not report vacancies; employment counsellors rely only on field visits to identify vacancies (i.e. they do not use other sources of information such as private job portals); and enterprises often do not publish vacancies at all, choosing to rely on informal channels of recruitment instead. During this period, there were 417 unemployed individuals registered in occupations related to the wood sector, of which 66, i.e. around 16 percent were successfully placed into jobs. Active labour market measures played a significant role in this respect, accounting for almost two thirds of job placements.

Table 2.3: Number of vacancies, unemployment and job matches (January – September 2017)

| | |
|---|---|
| **Registered unemployed** | **417** |
| **Vacancies** | **360** |
| Regular | 141 |
| Through active labour market measures | 219 |
| **Job matches** | **66** |
| Regular | 25 |
| Through active labour market measures | 41 |

Source: Employment Agency of the Republic of Kosovo, 2017

### 2.3.2 Future prospects for labour demand

The enterprises surveyed for the purpose of this study foresee bright prospects for the wood processing sector. The positive trends in demand for labour in the wood processing sector are expected to increase over the mid-term, as suggested by several firm-level indicators collected from the sample of largest enterprises in the sector. The expectations with regard to future employment trends for different occupations are generally positive, with no expectations of decreasing employment reported in any of the occupations. Indications of increasing employment trends are particularly strong for the occupations of woodworking-machine tool setters and operators, with 83 percent of the respondents foreseeing an increase of employees, followed closely by cabinet-makers (80 percent) and wood product assemblers (72 percent) (see Table 2.4).

Table 2.4: Expectations for the future employment by occupation

| Occupation | Increase | Similar | Decrease | Don't know/ no answer |
|---|---|---|---|---|
| Woodworking-machine tool setters and operators | 83% | 17% | 0% | 0% |
| Cabinet-makers and related workers | 80% | 19% | 0% | 1% |
| Wood and related products assemblers | 72% | 22% | 0% | 6% |
| Carpenters | 38% | 14% | 0% | 48% |
| Wood treaters | 14% | 25% | 0% | 61% |

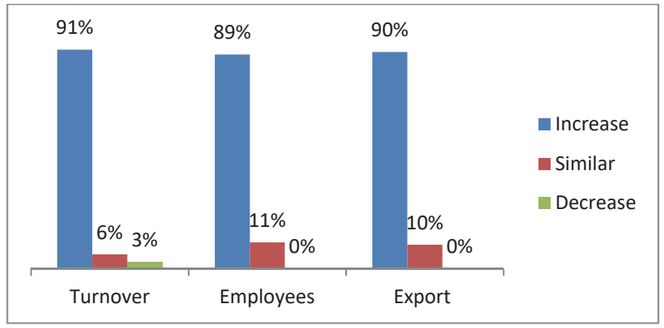
The expectations for increasing employment in the sector are in line with other indicators collected from the survey. When asked about the perceptions for the future of the sector, 83 percent report that the sector is growing, whereas the rest expect it to remain at a similar level (with the exception of one enterprise).

The surveyed enterprises share even more positive expectations when asked regarding their own business activities for the medium term. The share of those that expect to increase their turnover, employees and exports[6] ranges between 89 and 90 percent (Figure 2.3). The remaining firms tend to report expectations of similar economic activity and employment.

[6] For exports, for non-exporters, plans to start exporting is recorded as an increase if the enterprise does not currently export.

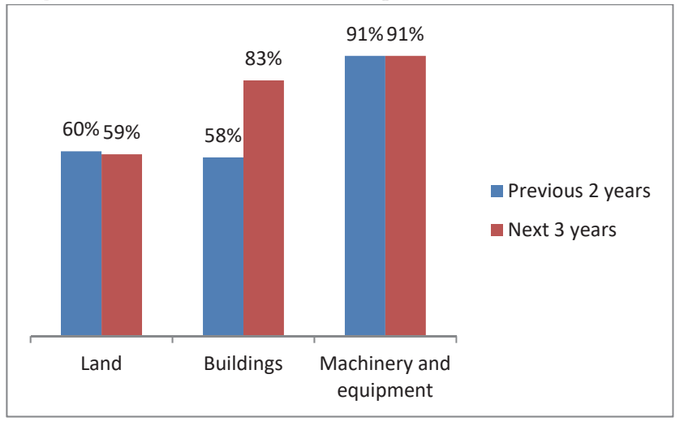


Figure 2.3: Expectations for the future economic activity




Such expectations are in line with responses on recent and future investment. Namely, around 90 percent of surveyed enterprises report investment in machinery and equipment, whereas around 60 report investment in land and/or buildings over the past two years (see Figure 2.4). Reported intentions for investment over the next 3 years are either similar or higher.

Figure 2.4: Recent investment and plans for future investment




### 2.3.3 Education level: typical and preferred level of education

For the selected occupations, enterprises were asked to indicate both the typical level of education for current employees and their preferred level of education. The results, summarised in Table 2.5 below, suggest some differences among occupations, though the general secondary education (gymnasium) dominates among current employees of all occupations[7]. In line with expectations, the preferred level of education is somewhat higher than the current one, on average. However, the most striking finding in this regard is the large discrepancy between the typical and preferred type of secondary education. With the exception of cabinet-makers and related workers, vocational secondary graduates are most preferred for all occupations. The differences between current and preferred types of

[7] The high share of firms indicating tertiary education as the typical level of education for cabinet-makers and related workers is surprising and not consistent with UNDP (2016) findings. This discrepancy is likely explained by a combination of factors. There appears to be an overlap of tasks and no strict separation between woodworking-machine tool setters and operators and cabinet-makers among some enterprises. Therefore, some employees which were reported as cabinet-makers in UNDP (2016) were likely reported as woodworking-machine tool setters and operators in this survey, while those that perform also higher-level tasks such as design of products were reported as cabinet-makers (in line with UNDP, 2016 findings that cabinet-makers also perform this task).

education are particularly strong for woodworking-machine tool setters and operators and carpenters.

Table 2.5: Typical and desired levels of education for employees

| Occupation/levels of education | Level of education | | Number of observations |
|---|---|---|---|
| | Typical | Desired | |
| **Woodworking-machine tool setters and operators** | | | |
| Primary Education | 3% | 0% | |
| General secondary education (gymnasiums) | 71% | 2% | 65 |
| Vocational secondary education | 23% | 86% | |
| Tertiary education | 3% | 12% | |
| **Cabinet-makers and related workers** | | | |
| Primary Education | 2% | 0% | |
| General secondary education (gymnasiums) | 24% | 2% | 58 |
| Vocational secondary education | 17% | 21% | |
| Tertiary education | 57% | 77% | |
| **Wood and related products assemblers** | | | |
| Primary Education | 3% | 0% | |
| General secondary education (gymnasiums) | 70% | 31% | 57 |
| Vocational secondary education | 27% | 60% | |
| Tertiary education | 0% | 9% | |
| **Carpenters** | | | |
| Primary Education | 6% | 0% | |
| General secondary education (gymnasiums) | 81% | 17% | 34 |
| Vocational secondary education | 11% | 83% | |
| Tertiary education | 3% | 0% | |

This mismatch could be due to a combination of factors, including: insufficient supply of vocational secondary education graduates for the sector (in the regions where the sector is more concentrated), lack of information among employers about relevant schools, and lack of satisfaction among employers with graduates from these schools. However, regardless of the reasons for the mismatch, this finding is important because it suggests that, contrary to what is sometimes believed, employers do not inherently prefer general secondary education graduates. From a policy perspective, this implies that an improvement of the quality and relevance (and geographical distribution) of secondary vocational education coupled with effective information to, and cooperation with, the private sector can improve the employment prospects of secondary education graduates.

### 2.3.4 Difficulties in recruiting skilled workers

Consistent with the reported mismatches above and with findings from previous studies, difficulty recruiting employees with the needed skills is widespread for all occupations in the wood processing sector. Table 2.6 presents the share of enterprises who have faced difficulties in recruiting employees of different occupations, as well as the number of enterprises who have had vacancies. Ninety-five percent of all enterprises in the sample report difficulties recruiting woodworking-machine tool setters and operators with the required skills for the job. Difficulties recruiting carpenters and cabinet-makers are also reported, however the former are relatively less sought in the market (i.e. only 34 enterprises had such vacancies, compared to 56 which had vacancies for cabinet-makers and related workers).



Table 2.6: Difficulties in filling vacancies

| Occupation | Difficulty recruiting | Observations (enterprises with vacancies) |
|---|---|---|
| Woodworking-machine tool setters and operators | 95% | 65 |
| Cabinet-makers and related workers | 80% | 56 |
| Wood and related products assemblers | 66% | 56 |
| Carpenters | 82% | 34 |

## 2.4 Supply of labour and skills development

Education and training provision for sector-specific technical skills for the wood processing sector is limited in terms of the number of programs provided and students/trainees enrolled. Programs are provided by secondary vocational schools, Vocational Training Centres of the Employment Agency of the Republic of Kosovo, and the Faculty of Architecture, Design and Wood Technology in the University of Applied Sciences in Ferizaj.

### 2.4.1 Labour supply from secondary vocational schools

At secondary education level two programs are provided: wood processing and carpentry. The number of students enrolled in these profiles (total in grades 10-12) in the last two academic years has continued to decrease, from 73 in the academic year 2015/16 to in 52 in academic year 2015/16 (Table 2.7). This is consistent with the trend of decreasing numbers of students and profiles provided in previous years (see EYE, 2016).

Table 2.7: Students in vocational secondary schools (2015/16 and 2016/17)

| Profile | 2015/16 | | | 2016/17 | | |
|---|---|---|---|---|---|---|
| | Enrolled/ inflow | Number of students/stock | Share of women | Enrolled/ inflow | Number of students/stock | Share of women |
| Wood processing | 15 | 40 | 33% | 20 | 43 | 33% |
| Carpentry | 12 | 33 | 3% | 7 | 9 | 9% |
| Total | 27 | 73 | 13% | 27 | 52 | 19% |

Source: MEST (2017)

The distribution of students in these profiles across schools and municipalities in the academic year 2015/16 is presented in Table 2.8 below. The geographical distribution of these profiles/students does not seem to be in line with the geographical distribution of enterprises in the wood processing sector, with the exception of the Wood Processing profile which is provided in secondary school Zenel Hajdini in Ferizaj where a significant share of enterprises is located (see the profile of the sector by MTI and UNDP, 2014).

Table 2.8: Distribution of students (2016/17)

| Programme/School | Number of students/stock |
|---|---|
| Wood processing | |
| Zenel Hajdini, Ferizaj | 40 |
| Carpentry | |
| Shaban Spahija, Peja | 25 |
| Nënë Tereze, Prizren | 6 |
| Nëna Terezë, Mitrovica | 2 |

### 2.4.2 Labour supply from vocational training centres

Vocational Training Centres of the Employment Agency of the Republic of Kosovo provide modular training courses, primarily for the registered unemployed. Training courses for Carpentry are provided by Vocational Training Centres (VTCs) in Ferizaj, Peja, Mitrovica, Gjilan and Doljan. The total number of certified trainees in these VCTs was 122 in 2015 and it increased by over 40 percent, reaching 176, in the following year (Table 2.9). The increase of the number of trainees and certified trainees came (primary) as a result of enhanced efforts to engage registered unemployed in vocational training (and other active labour market measures) and to increase the utilisation of existing physical and human capacities within VTCs, and could also reflect an increase in the overall number of the unemployed individuals registered at Public Employment Offices.

Table 2.9: VTC trainees in Carpentry, 2015 and 2016

| | 2015 | | 2016 | |
|---|---|---|---|---|
| VTC | Number of trainees | Number of certified trainees | Number of trainees | Number of certified trainees |
| Ferizaj | 45 | 38 | 71 | 57 |
| Peja | 35 | 27 | 57 | 50 |
| Mitrovica | 32 | 29 | 47 | 39 |
| Gjilan | 25 | 17 | 29 | 23 |
| Doljan | 15 | 11 | 7 | 7 |
| **Total** | **152** | **122** | **211** | **176** |

Source: MLSW Employment and Labour annual reports 2015 and 2016

### 2.4.3 Labour supply from higher education

The Faculty of Architecture, Design and Wood Technology in the University of Applied Sciences in Ferizaj (previously Faculty of Applied Sciences in Ferizaj, part of University of Prishtina) has provided different tertiary education programmes related to wood processing over the years. The programme it currently, Bachelor in Interior Architecture and Furniture Design, was introduced in the academic year 2014/15 (Wood Technology and Interior Design and Wood Technology were related predecessor programmes). A total of 54 students graduated from these programmes between 2012 and 2017, while currently the University enrolls around 100 students annually in the Interior Architecture and Furniture Design programme. In the academic year 2016/17 the total number of active students in this programme was 256, of which 44 percent women (Table 2.10).

Table 2.10: Students in the University of Applied Sciences in Ferizaj (2016/17)

| Programme | Enrolled | Total number of students | Share of women |
|---|---|---|---|
| Interior Architecture and Furniture Design | 116 | 256 | 44% |

Source: Faculty of Architecture, Design and Wood Technology (2017)

### 2.4.4 Skills development in enterprises

Given the difficulties in hiring candidates and the mismatch between the current and preferred educational attainment of employees, it is not surprising that all the surveyed enterprises report they provide initial on-the-job training for new employees. The reported length of the training ranges from 1-12 months, with an average of 4 months; however, two-thirds of enterprises provide an initial training of 1-3 months.



Enterprises also provide training for current employees. Around one out of ten of the surveyed enterprises report they do not review the skills of their employees. The majority of enterprises (83 percent) regularly review the skills of some groups of employees, while another 6 review the skills of all employees. Just over a third of the surveyed enterprises report that during 2016 (some of) their employees have participated in any external or internal training courses that were wholly or partly paid by the enterprise. However, when asked to list specific type of skills development, almost all enterprises report some non-formal on-the-job training (i.e. planned periods of training, instruction or practical experience in the workplace) (Table 2.11)[8]. External training (training provided by other providers, i.e. outside the enterprise) is the next most prevalent form of training, provided by around one in five enterprises. Other forms of internal training such as learning circles (i.e. groups of persons employed gathering on a regular basis with the primary aim of learning more about the requirements of the work organisation, work procedures and workplaces) and quality circles (working in groups with the objective of solving production and workplace problems through discussion) are provided by 15 and 9 percent of enterprises, respectively.

Table 2.11: Training provision

| Type of training | Share of enterprises |
|---|---|
| On-the-job training | 99% |
| Learning circles | 15% |
| Quality circles | 9% |
| External training | 19% |

### 2.4.5 Cooperation between employers and education and training providers

Based on the survey findings, there is some cooperation between larger wood processing enterprises[9] and education and training providers. Cooperation between wood processing enterprises and vocational secondary schools is most prevalent, with over 40 percent of enterprises reporting they have accepted interns or students from these schools while over 20 percent reporting to have contributed to curriculum development for these schools (see Table 2.12 below). Cooperation with higher education institutions in terms of internships and student visits is somewhat lower, which could reflect the limited number of programs and students that are relevant for this sector, however a similar share of enterprises (i.e. one in five) have contributed to curriculum development for such programs. Cooperation with vocational training centres is still lower, but it follows similar patterns, with receipt of on-the-job trainees being the most widely cited mode of cooperation, followed by trainee visits and curriculum development.

Table 2.12: Cooperation between enterprises and education and training providers

| **Institution/type of cooperation** | **Share of enterprises** |
|---|---|
| **Vocational secondary schools** | |
| Accepted interns | 42% |
| Contributed to curriculum development | 22% |
| Had visits from students | 43% |
| Tertiary education | 0% |

8 These were likely not reported in the general training regarding training due to the qualification of this question, i.e. the training being "paid partially or in full by the enterprises."
9 Note that the survey is not representative, but it covers some of the largest enterprises in the sector.

| | | |
|---|---|---|
| **Vocational Training Centres** | | |
| | Accepted on-the-job trainees | 28% |
| | Contributed to curriculum development | 17% |
| | Had visits from trainees | 20% |
| | Other | 2% |
| **Higher education institutions** | | |
| | Accepted interns | 30% |
| | Contributed to curriculum development | 20% |
| | Had visits from students | 23% |
| | Other | 6% |

When asked about their interest to cooperate with education or training providers, the vast majority of the surveyed enterprises say they are interested in cooperating in one or more of the following forms: accepting interns (trainees) or visits from students (trainees), and contributing to curriculum development.



## 3. Skills needs for woodworking-machine tool setters and operators

### 3.1 Overview of the occupation

According to the ISCO-08 classification, woodworking-machine tool setters and operators set-up or operate and monitor automatic or semi-automatic woodworking machines, such as precision sawing, shaping, planning, boring, turning and woodcarving machines to fabricate or repair wooden parts for furniture, fixtures and other wooden products.

The surveyed enterprises report that 29 percent of their employees currently perform at least one of the tasks of woodworking-machine tool setters and operators. It should be noted, however, that these figures should be treated with caution because (i) this survey is not representative of the population, i.e. it focuses on the largest enterprises in wood processing in Kosovo, and (ii) this occupation does not appear to be strictly defined as per the ISCO 08 classification and overlaps are particularly found between this occupation and that of cabinet-makers and related workers (as suggested both by the findings of this survey and those of UNDP, 2016). Regardless of these caveats, for practical considerations it is sufficient to know the prevalence of tasks related to setting and operating woodworking machines and tools and particularly the prevalence of use of CNC machinery. The results of the survey confirm that CNC machines are becoming increasingly important for this sector, with four out of five small and medium enterprises surveyed reporting their use. Before discussing the tasks performed by employees of this occupation and the skills requirements, a demographic profile of employees is provided next.

Over half of the employees in this occupational group is under the age of 30 (see Table 3.1). This could be partly explained by the fact that wood processing was not one of the key manufacturing sectors during the socialist period, so older employees with woodworking skills are not as widespread (compared to textile workers, for instance) and the sector has undergone significant technological changes in the meantime. At the same time, the increasing use of CNC machines is likely to make this sector more appealing to younger workers who are more apt and/or keen on working with computerised machinery.

Table 3.1: Employment by age

| Age of employees | Share |
|---|---|
| Under 30 | 54% |
| 31-49 | 26% |
| 50 and over | 20% |

This is a male-dominated occupation, which tends to be the case with machine operators in other countries too. The share of women employees in this occupational group is only 7 percent. The introduction of CNC machinery could lead to a somewhat higher presence of women as suggested by the experiences of other countries (e.g. WMC, 2008).

### 3.2 Occupational-specific tasks and skills

Table 3.2 below summarises the tasks performed by woodworking-machine tool setters and operators, ranked by their increasing importance in the future, as reported by the surveyed enterprises. Generally, the tasks related to this profession are very likely to become of increasing importance in the future.

Setting up, programming, operating and monitoring woodworking machines is the most widely cited task as well as the one which is most likely to be assessed as increasingly important (see also discussion below for more detailed information for different tasks within this task). Given the increasing importance of CNC machinery for the sector and previously identified skills gaps for CNC machinery operators, enterprises were further asked about this

type of machinery specifically. Four out of five enterprises reported that employees of this operational group use CNC machinery. Reading and interpreting specifications or following verbal instructions, selecting, installing and adjusting blades, cutter heads, etc. are other highly common tasks woodworking-machine tool setters and operators. Setting and adjusting various kinds of woodworking machines for operation by others, on the other hand, is a less common task, reported by less than half of the surveyed enterprises, which is not surprising considering the size of the enterprises and the fact that they predominantly provide custom-made products rather than serial production.

In addition to the tasks currently performed, enterprises were asked whether any of these (or other) tasks should be performed by woodworking-machine tool setters and operators in order to capture any gaps between the actual and preferred tasks, e.g. due to lack of skills, however the responses do not reveal any differences.

Table 3.2: Tasks performed and their future importance

| Task | Performed currently | Should be performed | Increasing importance (observations) |
|---|---|---|---|
| Setting-up, programming, operating and monitoring several types of woodworking machines for sawing, shaping, boring, drilling, planning, pressing, turning, sanding or carving to fabricate or repair wooden parts for furniture, fixtures and other wooden products | 99% | 100% | 98% (64) |
| *Operating CNC machinery* | *79%* | *80%* | *98% (54)* |
| Reading and interpreting specifications or following verbal instructions | 85% | 86% | 95% (56) |
| Installing and adjusting blades, cutter heads, boring-bits and sanding-belts, and using hand tools and rules | 94% | 95% | 93% (62) |
| Selecting knives, saws, blades, cutter heads, cams, bits, or belts according to workpiece, machine functions and product specifications | 89% | 89% | 93% (58) |
| Setting and adjusting various kinds of woodworking machines for operation by others | 42% | 43% | 92% (30) |

The skills and knowledge reported by employers as required to perform these tasks tend to be similar across tasks, therefore they are all presented jointly in Box 3.1 below, while some additional explanations on the skills required for different tasks are provided below. Although general skills are discussed again specifically in the next sub-section, some key general skills which are related to occupation-specific tasks are also listed and discussed here.

It is important to note that although respondents in the survey do not indicate differences between the current situation and a preferred situation in terms of the (Table 3.2 above), an analysis of responses on the skills required to perform the tasks of woodworking-machine tool setters and operators, together with validation and further inputs from in-depth interviews with enterprises reveal a different picture. Namely, within the first task specified in ISCO, i.e. "Setting-up, programming, operating and monitoring several types of woodworking machines for sawing, shaping, boring, drilling, planning, pressing, turning, sanding or carving to fabricate or repair wooden parts for furniture, fixtures and other wooden products", woodworking-machine tool setters and operators in Kosovo are typically limited to operating machinery and monitoring machinery operations. These employees do not conduct other tasks such as setting up machinery, setting optimal operation speed,[10] regular maintenance and inspecting for/diagnosing basic malfunctions. These additional tasks and skills requirements are in line with skills requirements for woodworking-machine tool setters and operator in other countries (e.g. see occupational standard for CNC operators in Canada (WMC, 2008) or job vacancies in many other countries) and are extremely important for enterprise competitiveness. Lack of regular maintenance, for instance, causes unnecessary machine breakdowns, requiring disruptions in the production process and the engagement of costly repair technicians from other countries. On the other hand, programming skills, are not required for all employees, though they would be desirable in some of the more advanced employees[11].

Box 3.1: Woodworking-machine tool setters and operator: Skills and knowledge required

**Reading skills and foreign languages**
- Reading materials such as machinery user guides in English (or German) in essential in order to learn how to set up machinery and conduct basic maintenance (e.g. to detect tool ware, to change oils regularly, to calibrate machinery, etc.).

**Math skills**
- Basic math skills (adding, subtracting, multiplication, division, etc.) and geometry for the purpose of calculating material fabrication.
  - Understanding of basic geometry particularly is needed to visualize how the wood pieces will fit together to fabricate a three-dimensional object (e.g. a piece of furniture).

**Technical skills**
- Ability to understand and interpret design drawings and model specifications.

**Critical Thinking**
- Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.

**Computer skills**
- Reading and editing code is considered desirable for more advanced operators, but not for the majority of workers.
- Knowledge of software is desirable: CAD (Computer Aided Design) software used to design the parts, CAM (Computer Aided Manufacturing) program is used to convert the CAD drawing to G-Code for the machine controller. E.g. some programs noted AutoCad (woodCAM|CAD), ArchiCad, ArtCAM.

**Knowledge of woodworking**
- Knowledge of types and properties of raw materials.
- Knowledge of basic woodworking techniques, tools and equipment.

**Knowledge of CNC machine processes and components**
- Knowledge of machines and tools, their components and their functions.
- Ability to monitor indicators to ensure the machine is working properly.
- Ability to set optimal machine operation speed and other settings, and to perform calibration.
- Ability conduct basic maintenance and malfunction diagnostics.

**Quality control analysis**
- Conducting inspections of machined parts to ensure they meet the blueprints specifications and required quality.
  - Knowledge of precision measuring instruments use and application of such instruments (e.g. calipers, micrometers, etc.) is desirable.

[10] While enterprises in the survey noted that employees conduct calibration, it was established that what they were referring only to calibration which is conducted automatically by the machine (e.g. due to temperatures changes or humidity), but not structural calibration in case the positioning of the tooling is affected, e.g., by external shocks and interventions in the software are required.

[11] In the survey, many enterprises cited 'programming skills' as a requirement, however it was later established that it is common for simple provision of instructions for the CNC machine to follow to be referred to as 'programming'.

## 3.2 General skills

Table 3.3 below provides the requirements of some of the key general skills for woodworking-machine tool setters and operators, ranked according to the likelihood of their importance increasing, as reported by the surveyed enterprises.

Use of computers is widespread and computer skills are also the ones which are most likely to be increasing in importance for the tasks related to this occupation (see Table 3.3 below). Almost a third of the enterprises report that advanced skills such as software programming are a requirement, however, as explained earlier, this figure for requirement of software programming skills should be treated with caution because, as explained in the previous sub-section, providing instructions for the CNC machinery seems to be commonly referred to as operating 'programming'. Another one in five enterprises further cite complex skills such as computer-aided design as a requirement.

In term of increasing importance in the future, computer skills are followed by numerical skills, which tend to be limited to simple calculations such as addition, division, averages, percentages, etc., but are universally sought among employees in this occupation. As explained in the previous sub-section, basic geometry is particularly needed to visualize how the wood pieces will fit together to fabricate a three-dimensional object (e.g. a piece of furniture).

Problem-solving skills and communication in a foreign language are also increasing in importance, although their current importance differs.

Table 3.3: Key general skill requirements, their future importance and preparedness of graduates

| Required skills | Level required/ importance | Increasing importance | Preparedness of graduates* |
|---|---|---|---|
| **Use of computers** | | 85% | 28% |
| Elementary (e.g. data entry, sending and receiving e-mails, printing) | 31% | | |
| Moderate (e.g. word processing or spreadsheets) | 14% | | |
| Complex (e.g. analysing information or design, including computer-aided design; using statistical analysis packages) | 19% | | |
| Advanced (e.g. software programming, managing computer networks) | 31% | | |
| None | 5% | | |
| **Use and understanding numerical or statistical information** | | 71% | 48% |
| Simple calculations (addition, division, multiplication) | 51% | | |
| Calculation of averages, shares, percentages, etc. | 32% | | |
| Knowledge of advanced calculus, statistical methods, etc. | 14% | | |
| Develop models, indicators of performance, complex calculations | 2% | | |
| None | 1% | | |
| **Communicating in a foreign language** | | 60% | 40% |
| Very important | 37% | | |
| Fairly important | 37% | | |
| Not important | 26% | | |
| **Solving complex problems** | | 59% | 27% |
| Very important | 51% | | |
| Fairly important | 46% | | |
| Not important | 3% | | |
| **Reading skills** | | 49% | 57% |
| Reading simple instructions, guidelines, texts | 63% | | |
| Reading occupation specific texts with some technical content | 25% | | |
| Reading with understanding complex texts which are important for work | 9% | | |
| Reading complex content from a wider context | 0% | | |
| None | 3% | | |
| **Writing skills** | | 26% | 77% |
| Writing simple texts, fill in forms, draft short reports on own activity | 65% | | |
| Writing texts which describe known occupation specific content | 15% | | |
| Writing complex occupation specific texts | 3% | | |
| Writing analyses, reports which assess the wider context of the business | 2% | | |
| None | 15% | | |

*Among enterprises that report increasing importance of the skill

Two-thirds of enterprises report that woodworking-machine tool setters and operators typically require basic reading skills, e.g. reading simple instructions and guidelines, occupation-specific texts with technical content, and sometimes reading and understanding of complex occupation related texts. However, as explained in the previous sub-section, ability to read occupation-specific materials such as machinery user manuals or other sources online in English (or sometimes German) should be an essential for at least some of the more workers which would enable them to perform all the required tasks, in line with occupational standards of other countries (e.g. WMC, 2008).

Writing requirements are somewhat less prevalent, their importance is relatively less likely to increase in the future, and the level required is typically not complex, i.e. it typically entails writing simple texts, filling forms, writing texts which describe known occupation-specific content.

In terms of preparedness of employees coming from the education system (either secondary or tertiary education), enterprises tend to have a low level of satisfaction. The low satisfaction with computer skills and problem-solving skills is particularly concerning, considering that their high and increasing importance for this occupation. On the other hand, satisfaction is relatively higher with writing and reading skills, followed by numerical skills and communication in a foreign language.

Other general skills that are important and increasing in importance are team work, employee autonomy (i.e. performing tasks independently), teaching/instructing others, adapting to new equipment or materials (Table 3.4).

Table 3.4: Other general skills requirements and their future importance

| Skill | Very/fairly important | Increasing importance |
|---|---|---|
| Team work | 100% | 90% |
| Autonomy | 95% | 85% |
| Teaching/instructing | 100% | 83% |
| Adapting to new equipment or materials | 100% | 82% |
| Manual dexterity | 89% | 72% |
| Minimising use of raw materials, energy and water | 97% | 62% |

| | | |
|---|---|---|
| Creativity/innovation | 82% | 57% |
| Communication | 48% | 22% |
| Sales | 34% | 22% |
| Setting objectives and planning resources | 23% | 17% |

### 3.3 Innovations, drivers of change and addressing emerging skills needs

Forty-five percent of the surveyed enterprises cite the occupation of woodworking-machine tool setters and operators as the occupation that is most affected by changes among the groups of employees they employ, while three quarters agree with the statement that this is amongst the most affected occupations. Changes in the tasks performed by this occupation group appear to be driven by innovations, which are widespread among the surveyed firms.

Only two out of the 65 surveyed enterprises reported no innovations in the previous two years. Most enterprises have engaged in product innovation, followed by innovation in production processes and labour organisation practises (Table 3.5). Among these, changes in production processes and the introduction of new/improved products have been the main drivers of change in terms of the tasks that are performed by woodworking-machine tool setters and operators.

Table 3.5: Innovative activities and their influence of the tasks performed

| Innovation | Share of enterprises | Influence on occupation* |
|---|---|---|
| New/improved products | 95% | 84% |
| New/improved production processes | 88% | 91% |
| New/improved labour organisation practises | 74% | 35% |
| New/improved sales and marketing methods | 45% | 14% |

*Among enterprises that report engagement in the respective activity

Around 70 percent of the enterprises also reported changes related to environmental protection. Among these, 43 percent reported that these changes affected the tasks performed by woodworking-machine tool setters and operators.

Training of existing staff is the most common means of addressing emerging skills needs in this occupation group, used by three quarters of the surveyed firms report. When asked if they face difficulties in finding trainers or training courses for such skills, around 1 in 5 enterprises report having faced difficulties, while the remaining ones either report no difficulties or do not know (or have not sought training). Internal reorganisation of staff and recruitment of new staff are other means of addressing emerging skills needs (used by 19 and 14 percent of enterprises, respectively).

### 3.4 Working conditions and physical preparedness

According to the surveyed enterprises, the work of woodworking-machine tool setters and operators is conducted in closed and noisy working premises and the working environment may sometimes be warm or cold, with odours or vibrations.

In terms of physical preparedness of employees, standing, walking, kneeling, etc. are typical activities required (reported by 80 percent of enterprises), followed by coordinated eye and hand movements and physical strength (reported by 31 and 25 percent of enterprises, respectively).



## 4. Conclusions and recommendations

Secondary data and previous analyses of the wood processing sector in Kosovo point to a growing sector, with potential for further expansion in both domestic and export markets. The surveyed enterprises, which are some of the largest enterprises in the sector, express optimism with regard to future trends for employment, growth and exports. In line with these expectations, many of them report recent and planned investments in land, buildings and machinery.

The demand for labour appears to be increasing, with the most prevalent current occupations also being most likely to grow in the future, particularly, woodworking-machine tool setters and operators, cabinet-makers and related workers, and wood and related products assemblers. However, these occupations are also the ones for which enterprises are more likely to report difficulties filling vacancies with the employees with the required skills, with the difficulties filling woodworking-machine tool setters and operators being almost universal across the surveyed enterprises. The occupation of woodworking-machine tool setters and operators is also considered among those – if not the one – most affected by changes in the sector, the changes being driven mainly by the introduction of new or improved production processes and products.

There is a marked difference between the level and type of education of current employees and preferences of employers. Namely, while general secondary education graduates are most prevalent among all occupations, employers state their preferences for employing more vocational secondary education graduates (and more university graduates, in some cases). This mismatch may be causing to lower labour productivity and additional costs for enterprises who have to provide on-the-job training for newly hired employees.

On the supply side, providers of sector-specific skills are a few secondary vocational schools which provide wood processing or carpentry profiles, five Vocational Training Centers of the Employment Agency of the Republic of Kosovo which provide short modular trainings primarily for registered unemployed individuals, and the Faculty of Architecture, Design and Wood Technology in the University of Applied Sciences in Ferizaj. In 2016, the number of students in wood processing-related secondary education was 52, while the number of certified trainees from Vocational Training Centres and number of students in the University of Applied Sciences in Ferizaj in the Bachelor programme in Interior Architecture and Furniture Design was higher (at 176 and 256, respectively). In recent years, a declining trend in enrolment is noticed in secondary vocational schooling, but an increase in higher education and in Vocational Training Centres. However, enterprises in the wood processing centre do not appear to particularly seek graduates of these institutions, and the supply of relevant secondary education particularly is limited and not in line with the geographical distribution of these profiles, which is not fully in line with the distribution of enterprises in the sector.

The enterprises themselves play a significant role in developing occupation-specific skills. All surveyed enterprises provide initial on-the-job training for new employees, typically lasting 1-3 months, and training of existing employees is also common. On-the-job training was provided by all enterprises during 2016 (which could be partly explained by the high prevalence of initial training). Other forms of training, external training, learning circles and quality circles were also reported, though they are not as widespread.

There is some cooperation between larger wood processing enterprises and education and training providers, with the share of surveyed enterprises that report cooperation with such institutions ranging between roughly 30 percent (for higher education institutions and Vocational Training Centres) and 40 percent (for vocational secondary schools). The most

prevalent forms of cooperation are student internships (or on-the-job trainees), followed by student/trainee visits and contribution to curriculum development.

Woodworking-machine tool setters and operators are employed in all the surveyed enterprises and they constitute a significant share of the workforce, though their tasks and those of cabinet-makers and related workers do not appear to be strictly defined in Kosovan enterprises.

Woodworking-machine tool setters and operators in Kosovo perform the following tasks, listed as according to their prevalence as reported by the surveyed enterprises:

- ✓ Operating and monitoring woodworking machines to fabricate wooden parts of furniture and other wooden products; among four out of five surveyed firms this includes CNC machinery, however this share is expected to be significantly lower in other enterprises which are smaller, on average.
- ✓ Selecting knives, saws, blades, cutter heads, etc. according to workpiece, machine functions and product specifications;
- ✓ Installing and adjusting blades, cutter heads, etc.;
- ✓ Reading and interpreting specifications or following verbal instructions;
- ✓ Setting and adjusting various kinds of woodworking machines for operation by others.

According to the employers, importance of all the above tasks is expected to increase in the future, though this is less likely to be the case for the last task, which is also the least common one.

Although the surveyed enterprises do not report (significant) differences between current and desired tasks for this occupation, further analyses of questions on skills requirements, analysis of skills requirements in other countries, and insights from in-depth interviews with two enterprise representatives reveal that the range of tasks of employees of this occupation in Kosovo is limited by a limited skill-set. Namely, setting-up and programming of woodworking machines, which also is part of the tasks according to the ISCO classification, as well as other tasks such as machinery maintenance and calibration, are not done by employees in Kosovo.

To perform the tasks of woodworking-machine tool setters and operators, a range of occupation-specific and general skills and knowledge is required, particularly:

- ✓ Reading skills and foreign languages, for the purpose of setting up machinery and conducting basic maintenance;
- ✓ Basic math skills and geometry for the purpose of calculating material fabrication;
- ✓ Ability to understand and interpret design drawings and model specifications;
- ✓ Knowledge of raw materials and basic woodworking technique and tools;
- ✓ Knowledge of machinery processes and components, particularly CNC machinery;
- ✓ Knowledge of CAD (Computer Aided Design) and CAM (Computer Aided Manufacturing) software, and at times, knowledge of programming, for more advanced employees.

Other general skills include problem-solving, critical thinking, team work, autonomy, teaching/instructing others, adapting to new equipment or materials and manual dexterity. These, as well as the use of computers and math skills are particularly considered to become increasingly important in the future. However, a large share of enterprises (between 43 and 73 percent) consider the graduates (coming either from secondary or tertiary education) as either 'fairly' or 'totally' unprepared in terms of use of computers, use and understanding of numerical information, communicating in a foreign language, solving complex problems and reading skills.



The following recommendations are given for enhancing the skills and employability of the workforce, and promoting enterprise competitiveness and growth:

- ✓ Given the prevalence, relevance and increasing importance of the occupation for the development of the sector, it is important that the occupational standard is developed for woodworking-machine tool setters and operators. The occupational standard and education and training programmes that are developed in the future should be based not only on the tasks performed and skills required currently in Kosovo, but also on the standards of other countries. Such education and training programmes would not only enhance employee productivity in the current tasks performed, but it would reduce the need for external expensive services of maintenance.
- ✓ The strong and increasing relevance of general skills such as reading, maths, problem-solving, critical thinking, etc., on the one hand, and the low assessment of preparedness by enterprises, on the other hand, points to the necessity to enhance the quality of basic education and to ensure that vocational schooling programmes develop general skills along with vocational skills.
- ✓ Education and training programmes should develop a combination of more 'traditional' skills and knowledge such as basic woodworking techniques and knowledge of machinery components and processes, and newly emerging skills related specifically to the use of CNC machines and CAD and CAM software.
- ✓ Given the fast pace of technological change in the sector, coupled with the high price of CNC machines to equip school/training labs, it is imperative that resources are rationalised, e.g. by strengthening cooperation between education/training providers and enterprises (through innovative forms of cooperation with the appropriate incentives to ensure feasibility and sustainability); and/or by sharing resources between education and training providers (e.g. between vocational schools and Vocational Training Centres).
- ✓ The reasons for the apparent indifference of employers towards existing sector-specific education and training programme graduates should be analysed, particularly focusing on the quality and market-relevance of curricula. The drop in enrolment in wood processing-related vocational secondary education programmes should particularly be analysed, as should the alignment of the geographical distribution of the schools offering these programmes with the distribution of enterprises operating in this sector.
- ✓ The opportunity provided by the increasing importance of CNC machinery should be used to promote the employment of youth, and particularly young women, into the sector.

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## Appendix: Key ISCO-08 occupations

**1 Managers**
**13 Production and Specialized Services Managers**
132 Manufacturing, Mining, Construction and Distribution Managers
1321 Manufacturing Managers
**2 Professionals**
**21 Science and Engineering Professionals**
214 Engineering Professionals (excluding Electrotechnology)
2141 Industrial and Production Engineers
**3 Technicians and Associate Professionals**
**31 Science and Engineering Associate Professionals**
311 Physical and Engineering Science Technicians
3115 Mechanical Engineering Technicians
312 Mining, Manufacturing and Construction Supervisors
3122 Manufacturing Supervisors
**7 Craft and Related Trades Workers**
**71 Building and Related Trades Workers (excluding Electricians)**
711 Building Frame and Related Trades Workers
7111 House Builders
7112 Bricklayers and Related Workers
7113 Stonemasons, Stone Cutters, Splitters and Carvers
7114 Concrete Placers, Concrete Finishers and Related Workers
7115 Carpenters and Joiners
**73 Handicraft and Printing Workers**
731 Handicraft Workers
7317 Handicraft Workers in Wood, Basketry and Related Materials
**75 Food Processing, Woodworking, Garment and Other Craft and Related Trades Workers**
752 Wood Treaters, Cabinet-makers and Related Trades Workers
7521 Wood Treaters
7522 Cabinet-makers and Related Workers
7523 Woodworking Machine Tool Setters and Operators
817 Wood Processing and Papermaking Plant Operators
8171 Pulp and Papermaking Plant Operators
8172 Wood Processing Plant Operators
**8 Plant and Machine Operators and Assemblers**
**82 Assemblers**
821 Assemblers
8219 Assemblers of wood and related products

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