



# **EDUCATION AND EMPLOYMENT OPPORTUNITIES IN THE HERZEGOVINA REGION AGRICULTURAL SECTOR**

March, 2014

This analysis has been prepared within the “Agriculture - Agribusiness Microenterprise Development in BiH” project, Fixed Obligation Grant (FOG) no. AID-168-F-13-00002, financed by the U.S. Agency for International Development (USAID).

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**Publisher: Citizens' Association “Nešto Više”**

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*Views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government*

## **LIST OF ABBREVIATIONS**

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**PPPsector-** Agribusiness Sector

**ILO** – International Labor Organization

**UNDP BiH** – United Nations Development Program in BiH

**USAID** – United States Agency for International Development

**EU** – European Union

**FBIH** – Federation of BiH

**RS** – Republika Srpska

**HNK** – Herzegovina-Neretva Canton

**ZHK** – Western Herzegovina Canton

**IPARD** – Instrument for Pre-Accession Assistance Rural Development

**REDAH** – Herzegovina Regional Development Agency

**KDBiH 2010** – BiH Business Classification 2010

**SKZ BiH-** Standard Classification of Businesses in Bosnia-Herzegovina

**GDP** –Gross Domestic Product

**FAO** – United Nations Food and Agriculture Organization

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## EXECUTIVE SUMMARY

This research and assessment of the situation in the Herzegovina Region agribusiness sector labor market aimed to provide the analysis of the degree of compliance between education opportunities and agribusiness labor market demand.

Based on the conducted research it was determined that there is a significant lack of balance between the supply and demand of labor force. The general economic situation in the Herzegovina Region could partly be the reason, but the burden to the regional labor market is mainly linked to structural problems.

The core of the structural problem, on one side, lies with those people in the labor market who had already gained certain skills and qualifications, but their skills and qualifications do not meet employers' needs, and, therefore, they stay unemployed over the long-term. On the other side, there is a gap between education policies and agribusiness labor market demand. The education policies do not regulate the number of qualifications and the kind of skills of future generations of high-school and university students in accordance with labor market demand, thus creating a long-term issue for the development of the region.

Particularly, in 2013, the unemployment rate in the Herzegovina Region agribusiness sector was 38.72%. There were 1,305 unemployed registered, which is the highest unemployment rate in the last three years. The situation is further complicated by the registered decrease in employment in the Herzegovina Region agribusiness by 16.97% in the last three years.

Such trends, followed by no education strategy and 1,000 high-school and university students to graduate in the field of agriculture in the next five years, additionally destabilize the labor market and cause the structural imbalance of labor force supply and demand.

If we look at the results of the survey of employers in the agribusiness sector, we see that there will be a demand for 253 workers in the forthcoming period. On the other side, it is estimated that some 330 workers in agribusiness are to be retired in the next ten years and that will create an additional demand for labor force.

Taking into consideration the previous assessment of the labor force supply of over 2,350 workers and its demand for just over 580, it is very clear that structural unemployment in this sector is a very serious issue. In other words, yet every fourth inhabitant of the region with agriculture occupation will get an opportunity to get a job in his/her field of education.

The fact that 65.71% of interviewed employers believe that the quality and the level of education of the labor force available in the Herzegovina region is not satisfactory makes this issue even more complex.

Dissatisfaction with the practical knowledge of secondary school and university graduates, as well as the fact that employers' needs for specific occupations are not followed by proper education programs are the most listed problems. Although the analyses of education programs show that secondary school and university students spend a significant amount of time practicing their knowledge from the field of agriculture, it seems that it is still not sufficient to make them equally competitive in the labor market.

The cause of such a situation could be the lack of interest and determination of students to gain sufficient practical knowledge and skills, but also the poor quality of practical teaching.

Basic recommendations of this analysis are as follows:

- In order to solve the problem of insufficient quality and practical knowledge, it is necessary that relevant institutions and NGOs that offer prequalification and informal education programs get actively involved;
- Development strategies are to include a carefully planned and long-term human resources strategy in order to control the admission quota and future education programs;
- Education policies should undergo changes and education institutions are to be a relevant actor in the development of local economy;
- Use the trend of demand for bio-products and the availability of unpolluted soil in Herzegovina to secure the recognition of organic food production, which will, consequently, be able to absorb the specialists qualified for this kind of production.

## INTRODUCTION

In the light of alarming privatization ventures, bad investment environment and sinking industry, agriculture, although small, still remains an important sector in terms of new employment opportunities and the absorption of surplus labor from other economic sectors.

With its favorable climate and raw materials at relatively low prices, agriculture in Bosnia-Herzegovina has an apparent competitive advantage over other countries. The agriculture season in BiH starts earlier than in most European countries (especially in the Herzegovina region), transportation costs are relatively low, and land prices and labor costs are lower than in other East European countries. According to the 2013 Labor Force Survey results, agriculture sector covers around 2.3 percent of employment<sup>1</sup>.

However, the most active segment of society in terms of economy, the one that, most probably, has a capacity and credit standing to develop sustainable rural businesses, is not involved in agriculture and rural development as much as necessary. On the other side, a big inconsistency between education programs and labor demand requires structural and thorough changes in education. These changes will be efficient only if they are in line with a long-term agriculture sector development planning.

In the context of the above-mentioned, the Association of Citizens "Nešto Više" started the "Support to Agriculture Development in Herzegovina" Project funded by the USAID program. The project aims to strengthen agricultural sector in the Herzegovina region, as well as to build up a connection between agricultural businesses and service providers. In order to achieve that, they plan to do the following:

- Analyze the circumstances and challenges that agribusiness encounters in the Herzegovina Region;
- Improve capacities of small and medium enterprises (SMEs) and strengthen the competency of farmers and other labor, especially young people and women, by creating an infrastructure that enables them to fully develop their capacities;
- Build effective partnerships between the Agribusiness Center for Professional Development (ACPD), academic institutions (universities and secondary schools), employers (SMEs), farmers, civil society organization and relevant government institutions responsible for agriculture and employment.

As part of the above-mentioned activities, an Analysis of Education and Employment Opportunities in the Herzegovina Region Agricultural Sector is to be conducted. The analysis will search for answers to the following questions: How developed is agribusiness in the Herzegovina Region? Are there enough qualified people to satisfy the needs? How many employment opportunities have the agribusiness sector

created? Is there a deficiency of qualified people in this sector? Whether the current education policy complies with the development strategy of this sector? What needs to be changed and what to be supported in creating expertise in agriculture, all in accordance with opportunities and nature characteristics of the Herzegovina Region?

The analysis and results are presented as follows:

- Research methodology
- Situation analysis in the Herzegovina Region
- Survey of employers in the Herzegovina Region agribusiness sector
- Conclusion and recommendations.

The first part refers to the description of methodology and it covers the phases of the situation analysis process, including aims and the scope of the survey, data collection and the analysis and processing of collected data.

The second part includes a socio-economic analysis, the needs analysis of skills and competencies, education programs and coordination between the supply and demand of occupations related to agriculture in the Herzegovina Region agribusiness. All the analyses were conducted based on data collected from statistics yearbooks, along with primary and secondary data obtained from the RS Employment Institute – Trebinje Area Office, Herzegovina-Neretva Canton, Western Herzegovina Canton and Canton 10 (Livno Canton) Employment Centers, BiH Federation and RS Statistics Institutes, secondary schools, universities, ministries, associations, chambers of commerce and other institutions.

The third part includes the analyzed data results obtained by interviewing employers in the Herzegovina Region agribusiness. A number of tables and graphs and basic findings summaries, obtained by interviewing employers, were used for the presentation of results.

In the last, fourth part, findings obtained during the research are presented along with recommendations for the Herzegovina Region economic development key actors' future activities that would lead towards better coordination of education programs and agribusiness labor market demand.

## 1. RESEARCH METHODOLOGY

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### 1.1. Aims and the scope of survey

A research was carried out during February and March 2014 in the Herzegovina Region in order to assess the current situation as to whether education programs are in line with the agribusiness sector labor demand.

The following are the specific tasks that were defined:

- Analyze the socio-economic situation, education programs and the current labor market in the Herzegovina Region;
- Conduct a survey of the agribusiness sector employers and assess their needs for additional labor;
- Come up with conclusions and recommendations in order to coordinate the education programs and the agribusiness labor market demand in the Herzegovina Region.

The following 23 municipalities in the Herzegovina Region were covered by the research: the City of Mostar, Čapljina, Čitluk, Jablanica, Konjic, Neum, Prozor – Rama, Ravno, Stolac, Grude, Ljubuški, Posušje, Široki Brijeg, Kupres, Livno, Tomislavgrad, Berkovići, Bileća, Gacko, East Mostar, Nevesinje, Trebinje and Ljubinje.

### 1.2. Data collection

The *desk research* method was used to collect and analyze the secondary data, and the primary data was collected by using a questionnaire.

Besides the general questions about employers, the questionnaire included questions on whether they were interested to engage new workers, whether it was possible to find workers they need on the labor market and whether they were satisfied with new workers' skills. The questionnaire comprised of: (a) multiple choice questions and (b) questions/comments to be filled in by respondents.

The data available in the database of business agents (business directory), primarily the data from the REDAH Information Center<sup>2</sup> database, which are verified and coordinated with the Ekapija<sup>3</sup> business portal database, BiH Federation Ministry of Development, Entrepreneurship and Craft<sup>4</sup> database of business agents, RS Chamber of Commerce database of business societies and entrepreneurs<sup>5</sup> and the judicial portal registry of business agents in BiH<sup>6</sup> were used for the purpose of agribusiness sector needs analysis.

In the process of reviewing and filtering, 20,489 business agents in the Herzegovina Region were looked into. Out of those 20,489, 436 sample companies (2,12%) that suited the research criteria according to the 2010 BiH Business Classification and the sort of business that belongs to the area/branch/category of agribusiness were identified. Thereafter, primary data was collected via telephone interviews. Some respondents requested to send their answers in writing (by e-mail or fax) and their request was met. Out of all interviewed companies, 92 provided answers to the questionnaire.

### **1.3. Data analysis and processing**

The labor market needs analysis results were compared to the survey results of the Herzegovina Region education programs related to agriculture. The Microsoft Excel statistical functions were used for this analysis, and the comparison analysis were presented in graphs and tables. By using synthesis and deduction methods, a conclusion was reached and recommendations were made on actions to be taken in order to improve the agribusiness labor market and to enable a more efficient competitiveness of this sector at both national and international markets.

## 2. CURRENT SITUATION ANALYSIS

### 2.1. SOCIO-ECONOMIC ANALYSIS OF THE HERZEGOVINA REGION

Herzegovina represents the natural, climate and geographic unit of the southern part of Bosnia-Herzegovina. Although there is still no single standpoint on what and who represents the region, for the purpose of this analysis, the Herzegovina Region will be described as a geo-economic and administrative area that includes three cantons in the BiH Federation and a part of Republika Srpska. The following 23 municipalities are part of the Herzegovina Region: the City of Mostar, Čapljina, Čitluk, Jablanica, Konjic, Neum, Prozor – Rama, Ravno, Stolac, Grude, Ljubuški, Posušje, Široki Brijeg, Kupres<sup>7</sup>, Livno, Tomislavgrad, Berkovići, Bileća, Gacko, East Mostar, Nevesinje, Trebinje and Ljubinje.

The Herzegovina Region covers the area of 12.075,17 km<sup>2</sup>, which is 23.58% of the area of BiH. Out of that, 68.69% is in the BiH Federation and 31.31% in Republika Srpska.

Figure 1. Map of the Herzegovina Region



Source: Federal Institute for Development Programming

### 2.1.1 Nature characteristics

#### *Climate*

In Herzegovina, 700m of height above sea level represents the division line between the low and the high Herzegovina, which is not clearly visible due to a number of hillocks, hills and lower mountains.

The low Herzegovina has sub-mediterranean climate with long, dry and hot summers, mild autumns/springs with occasional rain, and short, windy winters with no much snow and longer rainy periods.

The high Herzegovina has a modified and milder version of continental, Central European type of climate, with long and cold winters with heavy snow, rainy and windy springs/autumns and short summers with short showers.

The average temperature in the low Herzegovina is around 15.5 °C with more than 200 sunny days over a year, and an average precipitation of 1,400 l/m<sup>2</sup>.

The low Herzegovina, i.e. the coastal and sub-mediterranean area, covers the south of the region with the Neretva and Trebišnjica rivers spanning in the south and south-east, and the Buško Lake in the south-west. The vicinity of the Adriatic Sea has a crucial effect to the air temperature, the quantity of precipitation and other climate characteristics. This area is known for clear skies and a large number of sunny days per year. These climate features are good for agriculture, especially the greenhouse production, vineyards and outdoor growing of fruits and vegetables. The vegetation period lasts for about 300 days, the longest period with no frost is 283 days and the shortest 211 days. The thermal coefficient is 8.8, and heliothermal 5.9, which are very favorable climate conditions for agriculture. The precipitation of 1,500 l/m<sup>2</sup> per year is a lot, but periods are not equal. There is more rain outside than during the vegetation season, which very often causes floods that are occasionally catastrophic. Frosts during the vegetation period are rare, but when they occur they cause big damages and sometimes disasters<sup>1</sup>.

The high Herzegovina is the north continental part of the region with mountains and a wide range of climates, partly influenced by sub-mediterranean south and largely by mountain and continental climate. This area is mostly comprised of hills and mountains. Depending of the height above sea level and locations, annual precipitations range from 1,100 to 1,500 l/m<sup>2</sup> and are not equal each year. Here, like in the low Herzegovina, flood and dry seasons periodically change, which puts agricultural activities at risk. However, the high Herzegovina area is very good for growing continental vegetables, potato and cabbage<sup>2</sup>.

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<sup>1</sup>Strategy of Agriculture Development in the Rural Areas of the Herzegovina-Neretva Canton 2012 - 2017

<sup>2</sup> Industry of Fruits and Vegetables in BiH, published by UNDP BiH, 2013; source: <http://komorabih.ba/wp-content/uploads/2013/05/fruit-and-vegetable-industry.pdf>

## *Hydrography*

The Herzegovina Region water regime dominantly depends on precipitations that are more frequent in the autumn-winter period than during the vegetation period. Precipitations, due to non-regulated karst aquifers, are not sufficiently used for agriculture. Yet, plenty of precipitations formed a large network of watercourses and accumulations, which are an important agriculture resource.

The biggest and the longest river in this region is the Neretva that runs about 225km and provides water for the most part of the region. The second largest is Trebišnjica, an underground water, which runs through a very fertile field of Popovo Polje and represents the lifeline of this region.

All rivers in Herzegovina flow into the Neretva and Trebišnjica, apart from those in the part of Canton 10 (Livno) that flow into the Cetina river. The biggest water accumulation is in the municipality of Livno, the Buško Blato Lake, an area of 56.70km<sup>2</sup>, formed by smaller rivers, streams and some underground waters<sup>3</sup>. It is important to also mention an artificial accumulation, the Bilećko Lake on the Trebišnjica River, and the two natural mountain lakes, Boračko and Blidinje, and one formed by the river in Hutovo Blato (municipality of Čapljina).

Waters in the region are “clean” above average and they represent an invaluable resource for agriculture. Although from the above-mentioned one can draw a conclusion that the Herzegovina area is very rich with water, the region is, however, known as “dry and thirsty”. The reason for that is the lack of finances to implement irrigation projects that would significantly improve the results and water-supply.

## *Soil and forests*

Out of the total Herzegovina Region territory, 44% is covered with forests. The rest are karst fields, meadows and pastures.

The low Herzegovina forests are characteristic for bushes, and the high Herzegovina for large deciduous and pinewood areas with good-quality wood. There grows an endemic sort of white bark pine, which is a preserving, nice and an easily-workable wood of a compact structure<sup>4</sup>.

Terra rossa is the type of soil to be found mostly in the low Herzegovina, while high-quality and fertile mould prevails in the Herzegovina mountain area.

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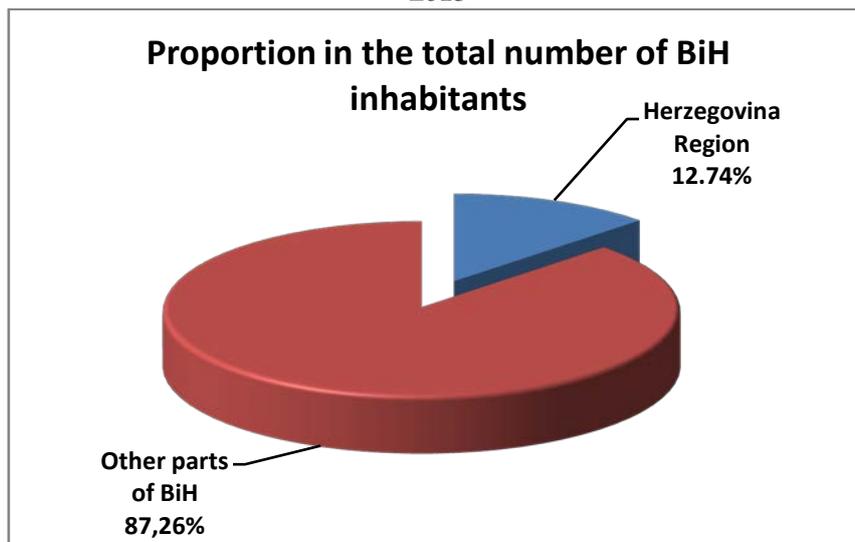
<sup>3</sup>Socio-economic Survey of the Mostar Economic Region, REDAH, 2003

<sup>4</sup>Ibid. 10

## 2.1.2 Demographic characteristics

According to the latest census from October 2013 preliminary data, there are 483,032 inhabitants in the Herzegovina Region<sup>5</sup>, which is 12.5% of the whole BiH population. Most of those people live on the BiH Federation territory, while 72,769 or 15.06% of them live in Republika Srpska. The number of inhabitants in urban areas is much higher than in rural areas, and every fourth inhabitant lives in the City of Mostar (113,169 inhabitants).

Figure 2. Number of inhabitants in the region vs. the total number of inhabitants in BiH in 2013



Source: Author's estimation based on statistical data by the entity agencies and statistics institutes

The population density is 40.00 inhabitants/km<sup>2</sup>, which is far less comparing to the population density in BiH, which is 74.04 inhabitants/km<sup>2</sup>. For the purpose of comparison, the average population density of the region in 1991 was 44.08 inhabitants/km<sup>2</sup>, which was 4.08 inhabitants/km<sup>2</sup> more than today. This is mostly the consequence of the war in the 90's.

The total number of households in the region is around 131,661 and the average number of members in a household is 3.61.

Table 1: Demographic features of the Herzegovina Region

Part of the Herzegovina Region	Number of household units	Number of households	Number of people per household
FBiH	153.873	112.051	3,66
RS	31.416	21.610	3,37
<b>Total (Herzegovina)</b>	<b>185.289</b>	<b>133.661</b>	<b>3,61</b>

Source: Author's estimation based on statistical data by the entity agencies and statistics institutes

<sup>5</sup>BiH Statistics Agency: <http://www.bhas.gov.ba>; accessed on 1 February 2013

### **2.1.3 Economic Development**

The most developed industries in the Herzegovina Region are metallurgy/metal-working industry, construction industry, agriculture, power industry, forestry/wood-processing, and food industry. 80% of the total production activities and exports belong to big and medium companies. The most important one is Aluminij d.d. Mostar that employs 850 workers and has an export worth KM 30 million<sup>6</sup>.

However, the consequences of the war and bad privatization process, along with the global economic crises, have destroyed industries in the Herzegovina Region. Small companies that rose from the former big industries do not have good development strategies. All analyses indicate that in order for small companies to be transformed into MEs, they must have a better personnel structure, a recognized and quality product, the state should provide them with incentive programs for fiscal and tariff policy, and they need to have cluster production and strong connections with academic community through technological centers. However, the academic community lacks finances, the equipment they have is old, and they have insufficient experience in cooperation with business people. All of this makes the academic community a weak associate in the process of the development of SMEs in the region<sup>7</sup>.

Nonetheless, the Herzegovina Region has large potentials for the development of SMEs, especially in the area of agriculture, as well as the other industries. Like in other parts of BiH, the recovery of the economy in this region will depend on the speed and level of the development of SMEs. Creating conditions for the establishment and development of SMEs through incentive programs, as well as removing barriers for efficient business activities are the key factor to their development.

### **2.1.4 Microeconomic indicators**

The period from 2000 to 2008 in Bosnia-Herzegovina was marked by an economic growth and micro-economic stability, while in the period from 2009 to 2013, the global economic recession and the lack of structural reforms caused the economic slump. It had a direct effect on local consumption, decreased investments and foreign demand. It slowed down trade and construction activities and reduced industrial production. In 2012, the industrial production was reduced by 4.4%, export by 3.2%, and employment rate by 0.8%. According to the Eurostat statistical analysis, Bosnia-Herzegovina is at the very bottom on the GDP list with BAM 6,709.00 per capita, which is 28% the EU average (for 2012).

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<sup>6</sup>Strategy of Agriculture Development in the Rural Areas of the Herzegovina-Neretva Canton 2012 - 2017

<sup>7</sup> Ibid. 13

These negative trends inevitably led to the stagnation of economic growth and layoffs, i.e. the rise in unemployment rates in BiH in 2012.

The macro-economic situation in the Herzegovina Region is not better than in other parts of BiH.

The total GDP in the Herzegovina Region in 2012 was around BAM 3,211.47 million<sup>8</sup>, which is 12.04% as compared to the nominal GDP in BiH (BAM 25,654 million). The GDP in the BiH Federation part of the Region in 2012 was BAM 2,619 million, and in the RS part of the Region it was BAM 591 million.

Table 2: GDP in the Herzegovina Region

Part of the Herzegovina Region	Population	GDP (in BAM)	GDP per capita (in BAM)
1	2	3	4
FBiH <sup>9</sup>	410.263	2.619.760,00	6,39
RS <sup>10</sup>	72.769	591.707,00	8,13
<b>Total Herzegovina Region</b>	<b>483.032</b>	<b>3.211.467,00</b>	<b>6,65</b>

Source: Author's estimation based on statistical data by the entity agencies and statistics institutes

In 2012, the average net income in the Herzegovina Region was BAM 830.27. The average net income in the BiH Federation part of the Region was BAM 835.40, and in the RS part of the Region it was BAM 826.14. The average wage in the Herzegovina Region does not vary very much from the average net wage in the two entities in 2012, which amounts to BAM 830 in the Federation and BAM 818 in RS.

### Employment

The employment market is closely linked with economic development trends and economy in general. In the last five years, there is a constant increase of unemployed people registered at employment institutes and employment services.

In December 2013, the unemployment rate in BiH was 44.5%, the same as the previous year<sup>11</sup>.

However, according to the 2013 Survey on Labor Force<sup>12</sup>, in BiH, there were 1,133,000 in the working population, and 1,465,000 making up the non-working population. 822,000 people were employed, and 311,000 unemployed.

<sup>8</sup> Author's estimation based on data provided by the entity agencies and statistics institutes

<sup>9</sup> Estimation for the BiH Federation was done based on the estimation by the Federal Institute for Development Programming for 2012

<sup>10</sup> Estimation for RS was done based on statistical data from 2010 published within the ALALITIKA Project implemented by the Center for Social Research, <http://www.mojemjesto.ba> accessed on 24 February 2014

<sup>11</sup> BiH Statistics Agency, [www.bhbas.ba](http://www.bhbas.ba) accessed on 26 February 2014

<sup>12</sup> Labor Force Survey 2013; source: [www.bhbas.ba](http://www.bhbas.ba)

According to the Survey, the unemployment rate in BiH in 2013 was 27,5% and it decreased by 0,5% in comparison to 2012.

The employment situation in the Herzegovina Region does not vary from that in other parts of BiH. According to data by the entity statistics agencies, there were 162,824 working population in the Herzegovina Region in 2013.

In December 2013, 84,769 persons in the Region were employed, and 66,133 were registered as unemployed at the employment institutes and employment services in the region<sup>13</sup>. The registered unemployment rate in the Region was 43,82%. In the Federation part, the unemployment rate was 42,59%, and in the RS part it was up to 49,37%<sup>14</sup>.

Although the registered unemployment rate in the RS part of the Region in 2013 was higher than in the Federation part, it was decreased by 7,4% comparing to the same period the year before. On the other side, the unemployment rate in the Federation part of the Region was higher by 3,8% for the same period.

If you look at the qualifications of the unemployed, most of them have the third and the fourth level of secondary school education (44,332 or 67,04%), and 4,528 of them or 19,42% are not skilled workers.

The number of unemployed persons who hold college and university degree has been increasing over the last years and in 2013 it reached 11,62%.

Table 3: Qualification structure of persons looking for job in the Herzegovina Region in 2013

<b>Qualification</b>	<b>BiH Federation</b>	<b>RS</b>	<b>Herzegovina Region</b>
0 -unskilled	0,08%	-	0,07%
1 -low-skilled	20,14%	16,63%	19,42%
2 -semi-skilled	1,48%	0,92%	1,37%
3 - skilled	36,31%	36,82%	36,42%
4 -secondary education	30,31%	31,81%	30,62%
5 -highly-skilled	0,37%	0,98%	0,49%
6 -college degree	3,75%	2,51%	3,50%
7 -university degree	7,55%	10,33%	8,12%
<b>TOTAL</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Source: Author's estimation based on data by the Federal Employment Institute and the RS Employment Institute

<sup>13</sup>Data published on the Federal Employment Institute and the RS Employment Institute web sites; accessed on 14 February 2014

<sup>14</sup> Author's estimation based on data published by the F BiH and RS Statistics Institutes

The 2013 Labor Force Survey results are only available for the state and entity levels, and therefore it was not possible to do estimations on unemployment for the Herzegovina Region as per the ILO<sup>15</sup> methodology.

### **2.1.5 Education**

The education system in Bosnia-Herzegovina is very complex, decentralized and very often non-complementary. It lacks adequate responsibility and coordination lines.

Although education is coordinated by the BiH Ministry of Civil Affairs at the state level, it falls within the competence of cantons in the BiH Federation and in the Republika Srpska within the entity's competence. In Brčko it is within the competence of the Brčko District Government.

Such a decentralized system disables a uniform approach to education policies, it deepens discrepancies in human potential development in different parts of Bosnia-Herzegovina and it generates a number of problems in the line of competence, responsibility and coordination.

The complexity of the education system at the BiH state level is reflected in the Herzegovina Region.

Education in the BiH Federation part of the Region falls within the competence of the three Cantons: Herzegovina-Neretva, Western Herzegovina and Canton 10 (Livno). In the RS part of the Region, it is within the competence of the entity ministry. Hence, all decisions with regard to primary, secondary and higher education are made by cantons in the Federation, and the entity ministry in RS.

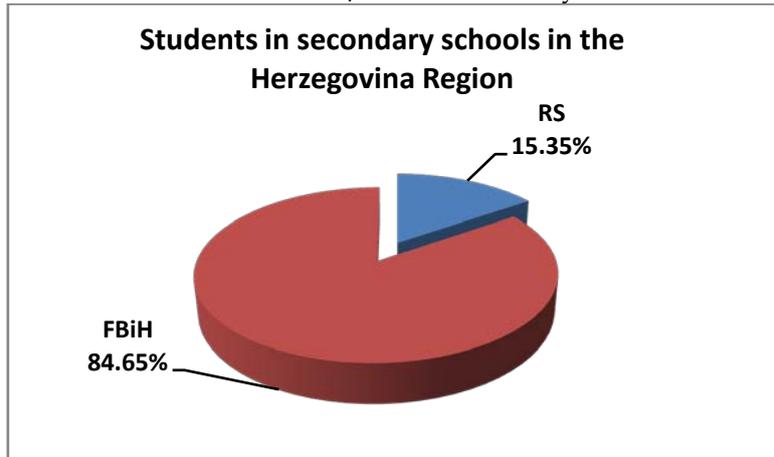
There are 51 public and three private secondary schools in the Herzegovina Region. The teaching is organized in 880 classes, with 21,655 students and 508 teachers<sup>16</sup>.

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<sup>15</sup> ILO –International Labor Organization

<sup>16</sup> Author's estimation based on data published by the Federal Statistics Institute and the RS Statistics Institute

Figure 3: Number of students in the 2012/2013 academic year in the Herzegovina Region



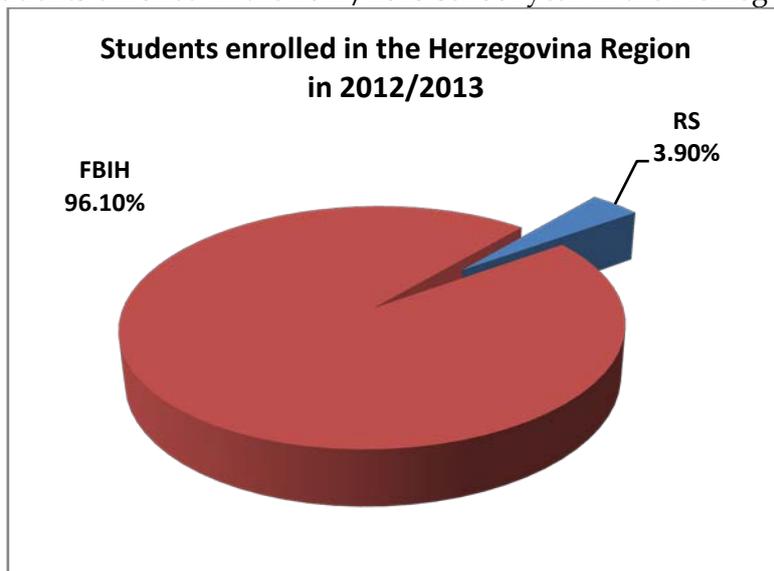
Source: Author's estimation based on data by the entities' statistics institutes

Higher education in the Herzegovina Region is based on the Bologna Process and it comprises of the following three levels:

- The first level is a bachelor's degree or equivalent with at least 180/240 ECTS points;
- The second level is a master's degree or equivalent with 60/129 ECTS points; together with the first degree it makes 300 ECTS POINTS;
- The third level is a doctorate degree or equivalent.

As in other parts of Bosnia-Herzegovina, there are a number of two-year colleges, faculties and universities in the Herzegovina Region. There are five universities with 26 faculties, and three two-year colleges. The total number of 14,418 students was enrolled at these higher-education institutions in 2012/2013, out of which 13,856 in the BiH Federation part of the Region.

Figure 4: Students enrolled in the 2012/2013 school year in the Herzegovina Region



Source: Author's estimation based on data by the entities' statistics institutes

On the other side, the concept of life-long learning and adult education that includes prequalifications, additional qualifications and professional trainings is organized through special programs by secondary schools and faculties, and through educational activities by education centers, associations and non-governmental organizations in the Herzegovina Region. The most prominent centers in the Region are the Education Center Mostar, Education Center Široki Brijeg and the Center of Secondary Schools Trebinje.

### **2.1.6 Potentials for Agriculture Development**

According to the research conducted by the UNDP BiH in 2013, Bosnia-Herzegovina is one of the most rural countries in Europe. It is the fourth on the list, just after Montenegro, Ireland and Finland.

In terms of its climate and orography, BiH has relatively good preconditions for the development of agriculture, especially in its southern part, where the agriculture season lasts longer due to weather conditions. As in any other Western Balkan country, consumers' priorities change in the way they spend money on food and agricultural products. They reallocate their food budget for the higher-quality foods, like water, vegetables, animal origin products, and, therefore, there is a growing market for those kinds of products<sup>17</sup>.

A land classification was done in the Herzegovina Region and it was determined that all agricultural land classes, except class I, are represented. Within those classes, the majority of the land falls under class VII, than class VI, V, IVb, III and II, and class IVa in the end. Land classes I - IV are to be primarily used for plow-land agriculture, while classes V and VI, in the lower areas, can be used for fruit-growing, vineyard and meadow management, and classes VII and VIII for pastures<sup>18</sup>.

Due to the climate conditions in the region, agricultural products are placed on the market earlier and for a longer period. The analysis on the lowest daily temperatures from 1993 to 2011 finds out that there are more days without frost than in the neighboring countries, with the lowest daily temperature above 0 °C. Thus, it is possible to start sowing already in March. This is particularly important for a cost-effective production of early fruits and vegetables. These characteristics could give the Herzegovina Region a comparative advantage when it comes to the long growing season and production that involves much labor force. Those products include early and late seasonal fruits and vegetables. The larger pasture and meadow areas in the north part of the Herzegovina Region have the potential for successful cattle breeding and dairy products.

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<sup>17</sup>Study on Agricultural Sector Policy in BiH; The World Bank, May 2010, page 1; source: <http://siteresources.worldbank.org/INTBOSNIAHERZ/Resources/AgriculturalSectorPolicyNoteForBHbos.pdf>

<sup>18</sup>Strategy on the Development of Agriculture in the Herzegovina-Neretva Canton Rural Areas 2012 - 2017

With the uncontaminated land (no extremely high concentrations of mineral fertilizers; pesticide level used per unit is the lowest in Europe) and local certificates for organic production on one side, and growing demand for bio-products on the other, the Herzegovina Region is well-positioned to make use of the new interest of consumers in organic food.

Taking into account the good geographical position and the vicinity of the sea ports and highways, which go through Croatia all the way down to the very south of Dalmatia, the Herzegovina Region has a big comparative advantage when it comes to the transport and placement of agricultural products on the highly-developed EU markets.

The agriculture land and labor are fairly inexpensive, especially comparing to the south Europe. According to the Labor Force Survey results and statistical data by the entities' statistics institutes and statistics services, it was recorded that agriculture absorbed around 1.7 percent labor, and agribusiness altogether absorbed over 17% of labor in the Herzegovina Region in 2012. On the other side, agriculture absorbs yet 40% labor that is not recorded, which indicates that agriculture remains an important employment sector regardless of the decrease of active labor in rural areas<sup>19</sup>.

Nevertheless, it needs to be emphasized that 36% rural households have "small farms". Those farms provide significant food, but they generate very little income. Just 13% of rural households are considered big farms, where people work full time, or it is their additional business, where they produce large amounts of food for sales. Even so, those households also make more than three-fourths of their income elsewhere. Less than 1% households could be classified as "commercial farms", where the IPARD<sup>20</sup> measures could be applied to improve agribusiness and marketing activities<sup>21</sup>.

### *Agriculture Development Challenges*

In the pre-war period, agriculture was a very important component in the BiH structure of economy including the Herzegovina Region. A massive damage has been caused in agribusiness as the result of the war. It was estimated at up to 4.5 billion USD<sup>22</sup>. 50% of vineyards and other agricultural production have been destroyed in the Herzegovina Region during the war<sup>23</sup>.

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<sup>19</sup>Labor Force Survey 2013

<sup>20</sup> IPARD – Instrument for Pre-accession Assistance in Rural Development

<sup>21</sup> Rural Development in Bosnia-Herzegovina: Myth or Reality, National Human Development Report 2013; source: [http://www.ba.undp.org/content/dam/bosnia\\_and\\_herzegovina/docs/Research&Publications/NHDR/2013/NHDR2013/BiH\\_NHDR\\_Brochure.pdf](http://www.ba.undp.org/content/dam/bosnia_and_herzegovina/docs/Research&Publications/NHDR/2013/NHDR2013/BiH_NHDR_Brochure.pdf)

<sup>22</sup> Analysis on the Competitiveness of Agricultural Products in BiH, *BiH Council of Ministers Directorate for Economic Planning*, November 2010, page 5

<sup>23</sup> K. Šoljić, J. Pavličević and Z. Milas: Opportunities for Agriculture Development in South Herzegovina, *Agriculture Courier* 1/2007, Croatian Agronomy Society, Zagreb, 2007, page 77

A slow and insufficient restructuring, low competitiveness of local production, laws that are not harmonized with the EU standards, a dysfunctional and inadequate institutional capacity and the lack of single agrarpolicy at the state level have brought agribusiness in BiH, including the Herzegovina Region, to an unenviable position.

Although there are substantial resources and potentials for its development, the participation of agribusiness sector in the GDP is constantly decreasing. In 2012, at the national level it was 8% and that is far less than in 1998 when it was 15.1%.

The liberalization of the trade of agricultural products makes the situation in agribusiness sector even more complex. It will create a more competitive business environment, while the EU membership of Croatia (Croatia and Serbia import the most of agricultural products from BiH) will make the export of BiH more difficult, including the Herzegovina Region when it comes to the export of agricultural products. Therefore, the Herzegovina Region has a trade deficit, and the balance between import and export in 2012 was somewhat over 52%. Unless major changes take place to stimulate agriculture and its export policy<sup>24</sup>, this trend will remain unchanged in future.

Even so, the agribusiness trade deficit is not affected by politics only. As a consequence of the changing needs of consumers, new market segments have emerged and local producers became uncompetitive. According to the report on the competitiveness of agricultural products in BiH<sup>25</sup>, one of the biggest issues is the quality of products. Another major factor that affects producers' competitiveness is the issue of land ownership (land is still registered on ancestors) and smallholdings. It is estimated that there are around 515,000 agricultural holdings in BiH. Out of the total number, over 50%, some 250,000 farms is smaller than 2 ha. If the 2-5 ha farms are added to that then the number goes up to 400,000, which is more than 80% farms smaller than 5 ha. Only some 20,000+ holdings, or 4% of the total number, is bigger than 10 ha<sup>26</sup>.

Thus, it is very important to pay special attention that in the future agricultural holdings become bigger, as well as to strengthen the capacity of producers in order for the EU standards to be applied on the security and quality of food. Food producers in the Herzegovina Region have to consolidate and integrate themselves both vertically and horizontally in order to improve quality standards, decrease costs and stimulate competitiveness.

Climate changes also pose a threat to productivity and, consequently, the competitiveness of agriculture in the Herzegovina Region. Current analysis indicate that BiH, including the Herzegovina Region, will be more affected by disasters like

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<sup>24</sup>Government funding for agriculture are by far smaller than in the neighboring countries.

<sup>25</sup> Analysis of agricultural products competitiveness in BiH, *BiH Council of Ministers Directorate for Economic Planning*, November 2010, page 22

<sup>26</sup> DG-AGRI: Study on the State of Agriculture in Five Applicant Countries, Bosnia and Herzegovina Country Report, Final Draft, 2006

droughts, floods and heat waves as compared to the other countries in the region<sup>27</sup>. Having in mind that only 0.5% fertile land or 0.8% arable land is irrigated, it is necessary to modernize this segment of agriculture<sup>28</sup>.

One of many challenges that agribusiness in the Herzegovina Region is facing is a long modernization period. The agriculture sector structure is similar to that of the south Europe 30 years ago, and productivity is generally much lower than in the EU nowadays<sup>29</sup>. The modernization of agriculture must certainly lead towards an increased productivity per area unit, head of cattle and work involved, and, in that manner, profits and incomes would also be increased.

The modernization of agriculture must be followed by proper policies to stimulate the population to get engaged in agriculture in the Herzegovina Region. Those most active in economy, those that most probably have the capacity and credit standing to develop steady agricultural holdings, are insufficiently involved in agriculture. The situation is further complicated by the rural population migrations towards urban areas. The number of rural population decreases by up to 10% with each generation. Cities can no longer absorb all people coming from rural areas, and, hence, good nature and climate conditions should be used for the development of agricultural businesses. The clear goal of the Herzegovina Region rural development<sup>30</sup> should be to keep people in rural areas.

Hence, the increase of productivity and competitiveness in agribusiness is one of the key challenges and aims of the rural development.

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<sup>27</sup> M. Baettig, M. Wild and D. Imboden: *A climate change index: Where climate change may be most prominent in the 21<sup>st</sup> century* *Geophys. Res. Lett.*, 34, L01705, 2007

<sup>28</sup> N. Mičić, G. Trbić, V. Todorović, S. Marković: Analysis on the vulnerability of fruits and vegetables to droughts in the north-east BiH, Development and Support Center, Tuzla, 2011; source: <http://www.crp.org.ba>

<sup>29</sup> Study on Agriculture Policy in BiH, The World Bank, May 2010; source: <http://siteresources.worldbank.org/INTBOSNIAHERZ/Resources/AgriculturalSectorPolicyNoteForBHbos.pdf>

<sup>30</sup> Rural Development in Bosnia-Herzegovina: Myth and Reality, National Human Development Report 2013, UNDP BiH; source: [http://www.ba.undp.org/content/dam/bosnia\\_and\\_herzegovina/docs/Research&Publications/NHDR/2013/NHDR2013/BiH\\_NHDR\\_Brochure.pdf](http://www.ba.undp.org/content/dam/bosnia_and_herzegovina/docs/Research&Publications/NHDR/2013/NHDR2013/BiH_NHDR_Brochure.pdf)

## **2.2. OCCUPATIONS AND SKILLS IN DEMAND IN THE HERZEGOVINA REGION AGRIBUSINESS**

For the purpose of this analysis, the secondary data collected by entities' statistics institutes and the following employment services and institutes were processed:

- Herzegovina-Neretva Canton Employment Service
- Western Herzegovina Canton Employment Service
- Canton 10 (Livno) Canton Employment Service and
- Employment Institute - Trebinje Area Office.

Due to the limited information system used by the entities' statistics institutes in BiH and their inability to provide the figures for those employed solely in agribusiness per single canton and municipality in the region, the data to be analyzed will cover the area of agriculture, hunting and fishing.

Also, due to the limited information system used by the employment services and institutes, the data on the unemployed who possess skills required for agribusiness will be analyzed only for the year 2013.

### **2.2.1. Herzegovina Region Agribusiness Labor Market Analysis**

#### *Employment*

The labor market is an inseparable part of the market economy and it basically represents the exchange of labor between the interested parties in a particular area or at a certain level. The supply and demand of labor force meet at the labor market. Labor is defined as a basic human value and, thus, the labor market is to be regulated and organized, but also to some degree independent.

If we look at the Herzegovina Region agribusiness labor market in the context of the above-mentioned, the supply and demand is referred to the total number of population on the agribusiness labor force market in the region. It means that all registered employed and unemployed persons who have the required skills and qualifications for agribusiness will be included in this analysis.

Since it was not possible to obtain separate figures on the employed in the food-processing business, the analysis will include the sector of agriculture only. The following table shows the demand for labor and the decrease in employment rate in the Herzegovina Region agribusiness in the last three years. The number of employed in this sector in 2012 decreased by 16.97% compared to 2010, which is a disturbing information.

Table 4: Decrease in employment rate in the Herzegovina Region agribusiness for the period 2010 - 2012

Herzegovina Region	Agriculture, forestry and fishing		
	2010	2011	2012
Herzegovina-Neretva Canton	868	801	810
Western Herzegovina Canton	214	161	113
Canton 10	1,045	997	879
Republika Srpska	360	323	263
<b>TOTAL</b>	<b>2,487</b>	<b>2,282</b>	<b>2,065</b>

Source: Author's estimation based on data by the entities' statistics institutes

Such a decrease in the employment rate in the sector of agribusiness is caused by many factors such as unprofitable production, agricultural holdings that are too small, high prices of products, uncompetitive local production, general economic crisis, as well as the slow economic growth in BiH, which was zero in 2012<sup>31</sup>.

#### Net wages in agribusiness

An average net pay in the sector of agribusiness in 2012 was BAM 648.49, which is 21.5% less than the average in the region. Although wages in the sector of agribusiness in the region are below the average, there was a 1.8% increase on an annual basis for the period 2009 - 2012.

Figure 5: Average net wages increase in the sector of agribusiness for the period 2009 - 2012



Source: Author's estimation based on data by the entities' statistics institutes

<sup>31</sup>European Bank for Reconstruction and Development (EBRD): <http://www.ebrd.com>

If we compare the average wages in the Herzegovina Region agribusiness with the wages in rural areas in other parts of BiH (BAM 733), we will notice that the average in this region is lower by 11.53%.

The lower average wages and less engagement of the population in agribusiness, inter alia, strongly affect the decrease of agriculture participation in the GDP, which was only 6.3%<sup>32</sup> in 2012. That is the lowest participation rate registered since 2008.

The low average wages in agriculture also affect the involvement of the rural population in this field. There is no interest in agriculture. According to the UNDP BiH data, the number of people involved in agriculture decreases by 50 percent with each generation<sup>33</sup>.

Still, if key decision makers in BiH become interested in agriculture, this negative trend could be changed and eventually stopped. It is necessary to make agriculture more competitive on the local and international markets and, in that manner, create good preconditions for its further development and, hence, an increase in wage in this sector.

### *Unemployment*

There is an increase in the number of registered unemployed persons with qualifications in agriculture in the Herzegovina Region in the last three years.

According to the Herzegovina Region employment services and institutes, there were 1,305 unemployed persons with qualifications in agriculture in December 2013, and 1,187 in 2012, so the unemployment rate increased by 9.94%. On the other side, the engagement of the unemployed in the total active agriculture labor force in the Herzegovina Region<sup>34</sup> is 38.72%, and the total unemployment rate in the Herzegovina Region is 43.82%.

The qualifications structure of the unemployed is as follows: 768 (58.85%) with secondary school education, 273 (20.92%) with a college and university degree and 264 (20.23%) skilled workers.

Most of the unemployed are agriculture technicians, 606 of them, which is 46.43% the total registered with agriculture qualifications in the Herzegovina Region. Then, 167 agriculture engineers (12.8%), 114 farmers (8.73%), etc.

The structure of the unemployed with qualifications in agriculture is presented in the following table.

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<sup>32</sup>BiH Statistics Agency; source: <http://www.bhas.ba/tematskibilteni/Tematski%20Bilten%20BDP%202005-2012.pdf>; accessed on 28 February 2014

<sup>33</sup> Analysis of agricultural products competitiveness in BiH, *BiH Council of Ministers Directorate for Economic Planning*, November 2010

<sup>34</sup> The total labor force in the sector of agriculture includes the total number of both employed and unemployed persons in this sector.

Table 5: The structure of the unemployed with qualifications in agriculture in the Herzegovina Region

OCCUPATION	HERZEGOVINA REGION				
	H-N Canton	Western Herz. Canton	CANTON 10 (Livno)	RS	TOTAL
1	2	3	4	5	6
<b>Skilled workers</b>					
Farmer	26	0	76	12	114
Laboratory technician	48	0	0	0	48
Bucher	29	0	0	5	34
Fruit grower	0	0	0	12	12
Flower grower	22	0	1	3	26
Cattleman	0	0	4	3	7
Food producer	0	0	0	8	8
Agriculture mechanic	0	4	0	11	15
<b>Secondary education</b>					
Agriculture technician	374	87	58	87	606
Food technician	0	0	54	3	57
Chemistry technician	37	0	0	0	37
Agriculture technician	24	0	12	9	45
Vineyard technician	12	0	0	0	12
Veterinary technician	0	0	0	1	1
cattle breeding technician	0	0	10	0	10
<b>College and university degree</b>					
Agriculture engineer (college degree)	141	0	23	3	167
Chemical engineer (college degree)	0	0	0	17	17
Food technology engineer (university degree)	15	0	2	10	27
Agriculture engineer (university degree)	0	1	11	40	52
Veterinary (university degree)	8	0	0	2	10
<b>TOTAL</b>	<b>736</b>	<b>92</b>	<b>251</b>	<b>226</b>	<b>1305</b>

Source: Author's estimation based on data by the Herzegovina-Neretva Canton, Western Herzegovina Canton, Canton 10 (Livno) employment services and the Employment Institute – Trebinje Area Office

It is important to say that persons are deleted from the register once they get a job<sup>35</sup>. Due to the lack of data for Canton 10 and the RS part of the Herzegovina Region, the following data refer only to the Herzegovina-Neretva and the Western Herzegovina Canton.

<sup>35</sup>According to the data and statements by the Herzegovina-Neretva and the Western Herzegovina employment services

In these two cantons, in December 2013, 16 persons with agriculture qualifications were deleted from the Herzegovina Neretva and the Western Herzegovina Canton employment services register, and such an employment trend is unchanged in the last three years. Twelve agriculture technicians got a job and the other four were one chemistry technician, one agriculture mechanic, one vineyard technician and one agriculture engineer. This trend illustrates that every 43<sup>rd</sup> agriculture technician has an opportunity to get a job, while the position of flower growers, food technicians, farmers, butchers, agriculture engineers, food technology engineers and others is even worse.

Considering the previously analyzed data on unemployment in the Herzegovina Region sector of agriculture, there is a great misbalance between the employment frequency and the number of registered unemployed persons with qualifications in agriculture.

That is, there is a decrease in demand for agricultural occupations in the Herzegovina Region labor market.

## **2.3. ANALYSIS OF THE EDUCATION PROGRAM IN THE HERZEGOVINA REGION AGRICULTURE REGION**

For the purpose of the analysis of the education program in the Herzegovina Region, the data processed were collected from the secondary schools, colleges and universities that have agriculture programs, and are registered in the region.

In order to compare the existing occupations and those obtained after the education in the Herzegovina Region, the data on the standard occupational classification for BiH from 2008 were processed, and based on that, a database of agricultural occupations was made (see Attachment 1).

### **2.3.1. Analysis of the secondary and higher education admission policy**

Education represents the key guideline of the labor market and it is the most important feature of the labor force competitiveness. Knowledge development, especially within the education system and sectoral occupations, is one of the competitiveness indicators based on domestic knowledge. Nevertheless, expertise and qualifications are not sufficient enough. Nowadays, the employed have to create, analyze and transform information, have to communicate, organize and coordinate business activities. They have to have excellent communication skills, have to be proficient with computer, and capable and ready to continue learning and develop their potentials.

Education in BiH, including the Herzegovina Region, is facing a number of structural, financial and program challenges. One of the biggest, probably, is the inability of education institutions to adjust their education programs to the most wanted occupations on the more and more demanding labor market.

#### *Secondary education*

There are 51 public and three private secondary schools in the Herzegovina Region. Seven of those schools have curricula related to agriculture and food industry. Those schools are in the Federation part of the region, while in the RS part of the region two such schools are to be opened in Bileća and Trebinje. According to their programs, these two schools are to educate students for future agriculture and food technicians.

The total of 506 students were enrolled in agriculture secondary schools in 2013. That is 2.31% the total number of students in secondary schools in the Herzegovina Region.

Figure 6: Number of students in agriculture secondary schools vs. the total number of secondary school students in the Herzegovina Region in 2013



Source: Author's estimation based on data by the entities' statistics institutes

The following schools have the agriculture and food-processing curricula and prepare students to work in the area of agriculture:

Table 6: List of secondary schools with the agriculture and food-processing curricula

Name	Occupation	Number of students
<b>Public Institution Secondary Textile and Agriculture School Mostar</b>	- agriculture technician (IV level)	18
	- semi-qualified flower-grower (III level)	11
<b>Public Institution Secondary School Konjic</b>	- agriculture technician (IV level)	118
<b>Public Institution Secondary School Čapljina</b>	- agriculture technician (IV level)	98
<b>Public Institution Secondary Trade School Tomislavgrad</b>	- agriculture technician (IV level)	78
<b>Public Institution Secondary Trade School Ljubuški</b>	- agri-turist technician (IV level)	176
<b>Secondary School "Education Center" Mostar (accredited school)</b>	- veterinary technician (IV level)	6
	- food-processing technician (IV level)	
	- agri-turist technician (IV level)	
	- agriculture technician fitopharmacist (IV level)	
<b>Secondary Trade School "Education Center" Široki Brijeg (accredited school)</b>	- agriculture technician (IV level)	unavailable
	- food-processing technician (IV level)	
<b>TOTAL</b>		<b>506</b>

Source: Author's estimation based on data obtained from secondary schools and education centers

## Higher education

As previously stated in the socio-economic analysis, there are five universities and three high-schools in the Herzegovina Region.

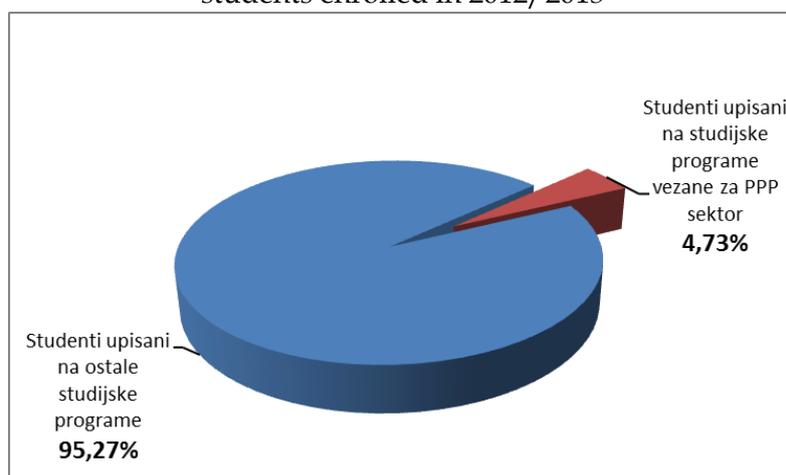
Table 7: List of higher-education institutions in the Herzegovina Region

Place/Region	Name of the higher-education institution	Number of students enrolled in 2012
Trebinje	<p><b>East Sarajevo University – Study Center Trebinje</b></p> <ul style="list-style-type: none"> <li>• Production and Management Faculty</li> <li>• Art Academy</li> </ul> <p><b>University for Business Engineering and Management Banja Luka – Study Center Trebinje</b></p> <ul style="list-style-type: none"> <li>• Economy Faculty</li> <li>• Law Faculty</li> </ul> <p><b>College for Tourism and Hotel Management</b></p>	562
Herzegovina-Neretva Canton	<p><b>University “Džemal Bijedić” Mostar</b></p> <ul style="list-style-type: none"> <li>• Faculty of Agronomy and Mediterranean Studies</li> <li>• Economy Faculty</li> <li>• Human Sciences Faculty</li> <li>• Information Technologies Faculty</li> <li>• Faculty of Civil Engineering</li> <li>• Mechanical Faculty</li> <li>• Faculty of Education</li> <li>• Law Faculty</li> </ul> <p><b>Mostar University</b></p> <ul style="list-style-type: none"> <li>• Faculty of Agronomy and Food-technology</li> <li>• Faculty of Economy</li> <li>• Faculty of Philosophy</li> <li>• Faculty of Science and Education</li> <li>• Mechanical and Computer-science Faculty</li> <li>• Art Academy</li> <li>• Medical Faculty</li> <li>• Law Faculty</li> <li>• Faculty of Health-care Studies</li> <li>• Faculty of Civil Engineering</li> <li>• Faculty of Pharmacy</li> </ul> <p><b>University “Herzegovina” Mostar</b></p> <ul style="list-style-type: none"> <li>• CKM Management Faculty</li> <li>• International Relations and Diplomacy Faculty</li> <li>• Faculty of Social Sciences</li> </ul> <p><b>College “Logos” Mostar</b></p> <p><b>College for Tourism and Management Konjic</b></p>	13,856
<b>TOTAL</b>		<b>14,418</b>

Source: Author's estimation based on data by the entities' statistics institutes

The Mostar University “Džemal Bijedić” Faculty of Agronomy and Mediterranean Science and the University of Mostar Faculty of Agronomy and Food-technology have agriculture study programs. Out of the total number of students enrolled to the higher-education institutions in the Region in academic year 2012/2013, 4.73% or 682 students were enrolled to those two faculties.

Figure 7: Number of students enrolled in agriculture study programs vs. the total number of students enrolled in 2012/2013



Source: Author's estimation based on data by the entities' statistics institutes

### Mostar University “Džemal Bijedić” Faculty of Agronomy and Mediterranean Science

In 1997, an Agronomy and Mediterranean Science Faculty was founded at the “Džemal Bijedić” University in order to develop a specific fruit-growing-vineyard and crop-farming-flower-growing production in the agro-ecology environment of the sub-mediterranean part of BiH.

The education system is organized according to the Bologna Process, and there are two first-degree study programs: 1. Fruit-growing-vineyard and 2. Crop-farming-flower-growing program. Graduating students get the title of Agriculture Engineer, B.A. (180 ECTS).

After the undergraduate studies, students can enroll in the postgraduate studies in one of the two following study groups: 1. Ecology and environmental management and 2. Fruit-growing. Graduating students get the title of M.A. in Agriculture Science (300 ECTS).

Only 14 students enrolled in those studies in academic year 1997/1998. Later, the number of students enrolled started increasing and in 2012/2013 reached the number of 194, 164 full-time and 30 part-time students.

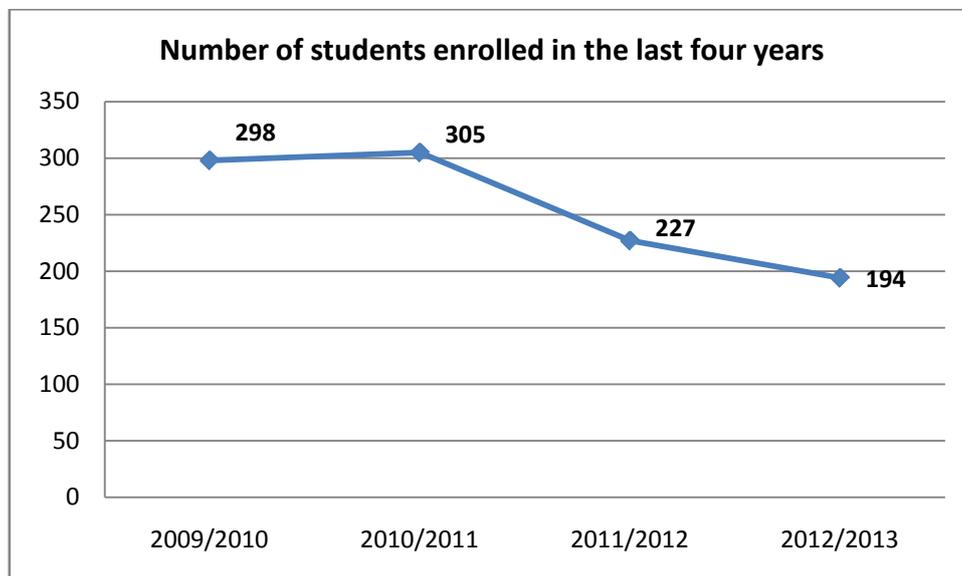
However, the number of students enrolled in 2012 decreased by 34.89% comparing to academic year 2009/2010. The number is actually decreasing in the last four years as shown in the following table:

Table 8: Number of students enrolled at the Agronomy and Mediterranean Science Faculty in the period 2009 - 2013

	2009/2010	2010/2011	2011/2012	2012/2013
Full-time	241	246	178	164
Part-time	57	59	49	30
<b>TOTAL</b>	<b>298</b>	<b>305</b>	<b>227</b>	<b>194</b>

Source: Author's estimation based on data by the entities' statistics institutes

Figure 8: Enrollment of students at the Agronomy and Mediterranean Science Faculty in the period 2009 - 2013



Source: Author's estimation based on data by the entities' statistics institutes

- University of Mostar Faculty of Agronomy and Food-technology

The University of Mostar Faculty of Agronomy and Food-technology provides education for agriculture and food industry. It was founded in 1994 as a result of the growing needs to educate specialists in agriculture.

The education system is also organized according to the Bologna Process and there are two first-degree study programs: 1. Agronomy and 2. Food Technology. Graduating students get the title of the 1. Bachelor in Agronomy (180 ECTS) and 2. Bachelor in Food-technology (180 ECTS).

After the undergraduate studies, students can enroll in the graduate studies in one of the three following study groups: 1. Plant production, 2. Agro-economy and 3. Food-

technology Engineering. Graduating students get the title of M.A. in Agronomy/Food-technology Engineer, M.A. (300 ECTS).

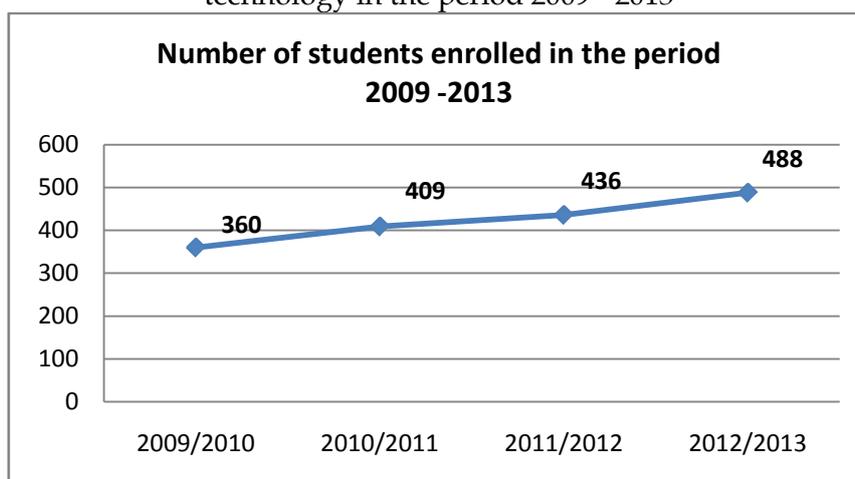
Unlike at the Faculty of Agronomy and Mediterranean Sciences, the number of students enrolling at the Faculty of Agronomy and Food-technology is constantly increasing. In 2012/2013, 488 students were enrolled, which is by 35.55% more than in 2009/2010.

Table 9: Number of students enrolled at the University of Mostar Faculty of Agronomy and Food-technology in the period 2009 - 2013

	2009/2010	2010/2011	2011/2012	2012/2013
Full-time	289	373	419	484
Part-time	71	36	17	4
<b>TOTAL</b>	<b>360</b>	<b>409</b>	<b>436</b>	<b>488</b>

*Source: University of Mostar Faculty of Agronomy and Food-technology*

Figure 9: Enrollment of students at the University of Mostar Faculty of Agronomy and Food-technology in the period 2009 - 2013



*Source: University of Mostar Faculty of Agronomy and Food-technology*

Based on the previously analyzed data, regardless of differences between the two faculties, the overall trend of students enrolling in agriculture studies in the Herzegovina Region has increased in the last four years. In fact, the total number of students enrolled at both faculties in the academic year 2012/2013 was 682, and that is 3.65% more than in 2009/2010. These projections indicate that in the next four years there will be more than 600 agronomy and food-technology engineers on the labor market.

#### Adult education

The adult education in the RS part of the Herzegovina Region is conducted in accordance with the RS Law on Adult Education. In the Federation part, the law has not yet been endorsed. The adult education in the Herzegovina Region is organized through special programs by secondary schools, faculties and education centers. The informal education is done through activities and projects implemented by different associations and NGOs.

The main centers for prequalifications and additional trainings with formal education programs in agriculture and food industry are:

1. Mostar Education Center and
2. Široki Brijeg Education Center.

These centers have formal programs for trainings and prequalifications in agriculture.

Different associations and NGOs, within their capacity and program activities, from time to time also organize informal professional trainings in agriculture/agribusiness. Some of them are:

1. Center for Rural Development and Agriculture of Herzegovina
2. Association of Citizens „Nešto Više“
3. NGO "Center for the Development of Herzegovina" Trebinje
4. Entrepreneurship and Business Association LiNK Mostar
5. Union of Agriculture Associations of the Jablanica Municipality
6. Union of Agriculture Associations of the Konjic Municipality

### **2.3.2. Analysis of education programs**

#### *Analysis of the secondary school programs*

The analysis of the Herzegovina Region secondary agriculture schools' curricula established that all agriculture schools, in addition to general courses, have professional courses like agricultural botanic, plant production, land management, farming, cattle-breeding, fruit-growing, grape-growing, crop-production, wine production, etc. included in their curricula(Attachment2).

Yet, none of the schools had a course that deals with modern ways of organic agricultural production, although, according to the analysis done by the World Bank and the UN FAO, BiH has excellent prerequisites for its development.

Also, there were no courses that would specify the adaptation of agricultural production to climate changes, although it is foreseen that BiH will be very exposed to climate changes in the forthcoming period. As envisaged, climate changes will especially affect the agriculture, and the adaptation in terms of machinery and

practice, as well as the additional selection and introducing of new sorts adapted to the new climate conditions, are necessary<sup>36</sup>.

It is interesting to point out that, according to the curricula, in the first three years students have altogether 240 hours of practice (80 per year). Practical classes are organized based on the job demand in agriculture, mostly in a summer season. In case of a four-year program, students have only 40 hours/year of practice during the final year and it is used to write the final paper.

The above-mentioned analysis leads us to the conclusion that the secondary school students have an opportunity to spend a significant amount of time practicing their knowledge in the area of agriculture during their education.

However, the survey of employers indicates that they are not satisfied with the practical knowledge of job candidates<sup>37</sup>. They are dissatisfied with students who seem not to be interested and determined to gain sufficient knowledge and/or the quality of practical teaching that they do not find satisfactory.

#### *Analysis of study programs*

The analysis of the Agriculture and Mediterranean Sciences and Agriculture and Food-technology Faculties' study programs finds that these faculties have specialized study courses like botany, plant-growing, agriculture mechanization, pedology, melioration, horticulture, transplanting, apiculture, gathering, packing and preserving of vegetables and flowers, fruit-growing, wine-growing, vegetable-growing, wine production, etc. (for detailed programs see Attachment 3 and 4).

Study departments of both faculties have courses like specialized vegetable-growing, production of organic vegetables, hotbed vegetable growing, which is a prerequisite to educate qualified specialists who will be able to respond to modern challenges of the agriculture development, especially in the Herzegovina Region.

This is particularly important when it comes to the organic production of high-value agricultural products. The development of the market and a growing demand for organic food need educated specialists who are able to respond to the challenges of this production.

Both faculties also have specialized courses that include agro-climate science (agro-meteorology). These courses aim at studying climate changes and the necessity to adopt agriculture to these changes. Thus, students have the opportunity to acquire particular knowledge that they will be able to apply in practice, and that is required by employers.

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<sup>36</sup>S. Radušin, S. Oprašić, M.Cero, I. Abdurahmanović, G. Vukmir: *BiH Second National Communication to the UNFCCC, Sarajevo, June 2013, page 76, source: [http://www.un.ba/upload/documents/BiH\\_SNCBiH\\_BHS-L.pdf](http://www.un.ba/upload/documents/BiH_SNCBiH_BHS-L.pdf)*

<sup>37</sup>BiH Federation Employment Institute, Analysis of the labor market and employment circumstances in FBiH in 2012 and estimations for 2013; source: [www.fzzz.ba](http://www.fzzz.ba)

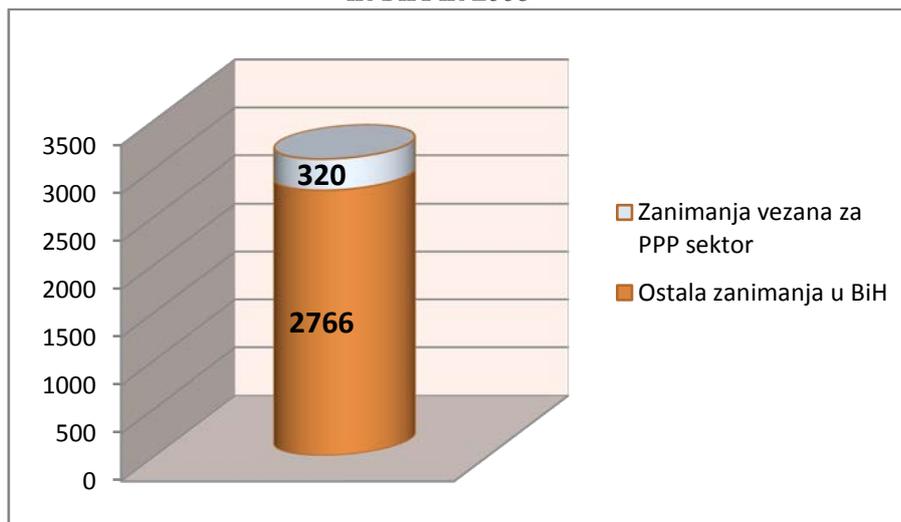
Over 45% of classes are practical classes and, thus, students have the opportunity to, besides the theoretical, also gain practical knowledge in the area of agriculture and food production.

Nonetheless, the same as in the case of secondary education, employers are not satisfied with the practical knowledge of job candidates<sup>38</sup>. They are dissatisfied with students who seem not to be interested and determined to gain sufficient practical knowledge and/or the quality of practical teaching that they do not find satisfactory.

### 2.3.3. Classification of occupations in the area of agriculture

The diversification of occupations on the Herzegovina Region labor market is obvious. According to the classification of occupations from 2008, 3,806 standard occupations were registered in Bosnia-Herzegovina, out of which 320 (8.4%) are related to agriculture (see Attachment 1).

Figure 10: Number of occupations according to the standard classification of occupations in BiH in 2008



Source: BiH Statistics Agency

Yet, if we look at the type of occupations obtained through the education system in the Herzegovina Region, secondary school and university students are educated for only 11 out of 320 occupations registered by the standard classification.

Even when they complete their education and gain particular knowledge within those 11 occupations, young people are facing serious objections by employers regarding their skills and qualifications. This is a big issue, especially with secondary education that provides them with specialized skills for the potential “first job”, but not good enough education for future jobs and occupations<sup>39</sup>.

<sup>38</sup>Ibid. 44

<sup>39</sup>Compliance between the market demand and education programs in BiH, CEPOS, Sarajevo, 2005

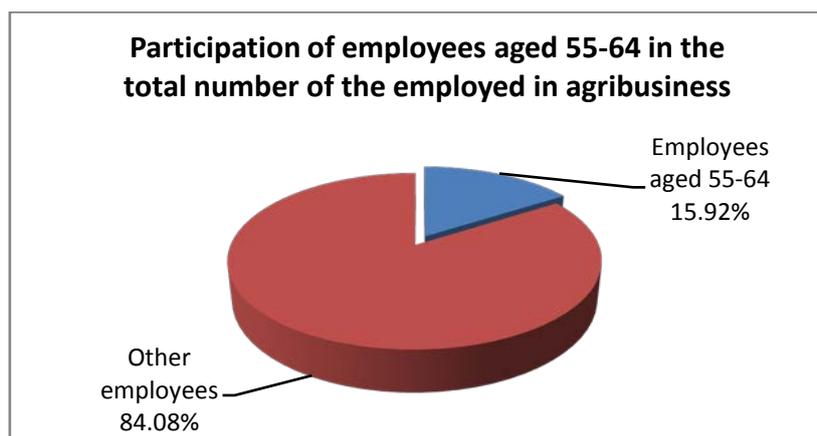
## 2.4. ANALYSIS OF COMPLIANCE BETWEEN THE DEMAND AND SUPPLY OF OCCUPATIONS IN AGRICULTURE IN THE HERZEGOVINA REGION

One of the macroeconomic aims of every country is full employment. Yet, it is almost impossible to reach full employment regardless of the area of economy. Not all of the population of working age are ready to compete on the growing and more and more demanding labor market. Therefore, it is very important to frequently analyze and compare supply and demand trends on the labor market. This is in order to appropriately approach the planning of education programs and their results as the key guideline of labor market.

In each such analysis, both the retirement age and development need to be taken into consideration and, thus, a surplus of young people per job, in reality could be deficient for mid-term development strategies. These exact principles will be applied during the analysis of the Herzegovina Region labor force supply and demand in the area of agriculture.

In the context of the above-mentioned, the pouring off of labor force to retirement can be done based on the analysis of age structure of those employed in agriculture. By such analysis, it was concluded that the number of employees aged 50–64 represents 15.92% of the total number of the employed in the area of agriculture. It was estimated that there will be a demand for 330 new employees in the next 10 years, since the same number will be retired.

Figure 11: Participation of employees aged 55-64 in the total number of the employed in the Herzegovina Region agribusiness in 2012



Source: Author's estimation based on data by the entities' statistics institutes

On the other hand, labor force supply is bigger than demand. This conclusion comes from the following:

- In 2013, 1,305 persons qualified in agriculture were registered at the employment institutes and services, and this trend is increasing.
- There were 500 students in agriculture secondary schools in 2012/2013, and 682 students enrolled at the University "Džemal Bijedić" Faculty of Agronomy and Mediterranean Sciences and the University of Mostar Faculty of Agronomy and Food-technology in the same academic year.

This means that there will be 1,000 new graduates qualified in agriculture on the labor market in the next five years.

Taking into account the previously analyzed trends, the estimated labor force supply in the Herzegovina Region agribusiness will lead to over 2,350 people in the next five years. It is far too many comparing to the estimated demand.

Hence, it is necessary to influence the admission quota, as well as the future education programs by a careful and long-term planning of human resources. In that manner, it is possible to, in a long term, influence labor force supply and demand in the area of agriculture, and make education institutions a relevant actor in the local economy development of the region.

### 3. ANALYSIS OF THE SURVEY OF THE HERZEGOVINA REGION AGRIBUSINESS EMPLOYERS

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#### 3.1. SURVEY METHODOLOGY

##### 3.1.1 Goal and subject of the survey

The primary goal to do a survey of the Herzegovina Region agribusiness employers was to get an insight of the real situation on the labor market because it was not possible to get the necessary data by the *Desk research* method. In order to draw objective conclusions and make recommendations, it is important that employers express their views, provide evaluations and make suggestions. In that way, the survey proves the authenticity of the whole analysis.

The subjects of the survey were employers that, according to the business classification, belong to agribusiness sector or have infrastructure resources and capacities for agribusiness in the Herzegovina Region. The 2010 Business Classification in BiH(KDBiH 2010) was used for the selection of relevant employers/businesses. Employers/businesses relevant for this analysis belong to the following area(s):

- Plant-growing, cattle breeding, hunting, and associated services
- Picking of wild fruits and produces, and gathering of forest products
- Fishing and aquaculture
- Food industry
- Meat processing and packing and meat production
- Processing and packing of fish, shells and seafood
- Processing and the preservation of fruits and vegetables
- Production of vegetable and animal oil and fat
- Dairy production
- Milling industry and corn production
- Bakery, flour products and cakes
- Other food products
- Animal feed production
- Production of beverages
- Wine production
- Tobacco industry
- Production of etheric oils
- Machinery for agriculture and forestry
- Machinery for food, beverages and tobacco industry
- Wholesale of agriculture raw materials and live animals
- Wholesale of food, beverages and tobacco products
- Wholesale of agriculture machinery, equipment and tools
- Road transport of goods
- Storage and associated transport services
- Storage of goods

- Research and experimental development in natural, technical and technological sciences
- Veterinary service

### **3.1.2 Tasks**

The following tasks were set according to the survey goals:

- Make a database of employers in the area of agriculture and associated food industry;
- Identify the current number of employees and the need of employers for additional labor force;
- Identify the demand for qualifications and occupations in agribusiness;
- Evaluate the employers' views on labor force qualifications and education program in the Herzegovina Region;
- Come up with conclusions and recommendations on how to coordinate labor force supply and demand in the area of agriculture in the Herzegovina Region.

### **3.1.3 Questionnaire**

Apart from questions on general information, the questionnaire had multiple choice questions. Employers could also add their own answers to almost all questions.

Aside from general questions on employers, questions on the number of employees, whether they are interested to get new employees, whether it is possible to find qualified people on the labor market and whether they are satisfied with the skills of new employees were also included in the questionnaire.

### **3.1.4 Data collection and the conduct of the survey**

The survey was conducted in March 2014.

It was carried out by the interviewers who had previously been prepared and trained for the task. In some cases the employers requested to fill out the questionnaire in writing and send it back by mail or fax. The survey results were presented in reports, tables and graphs, so they can be used for other purposes too. Although the same methodology was not used all the way through, the results are similar to those from other sources, like the ones found in statistical reports, studies, etc.

### **3.1.5 Sample**

A combination of cluster and relevant sample was used in the selection process. 436 companies or 2.12% that met the search criteria according to the BiH Classification of

Business or agriculture area of work/branch/class were selected. Out of the total number, 92 companies provided their answers.

### 3.1.6 Data analysis and survey results review

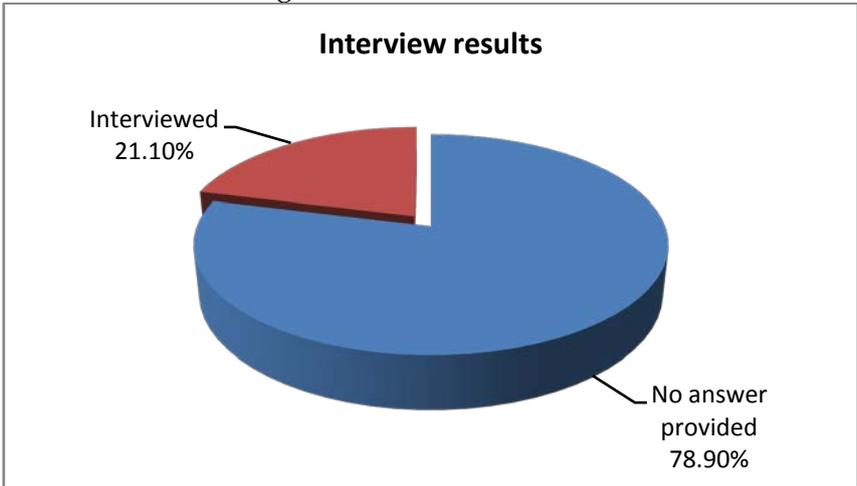
Straight after conducting an interview, the collected information was inserted in a previously prepared database table (Excel). At the same time data were reviewed in terms of their complexity; whether they were sufficient in order to analyze the views of each and every employer.

Certain indicators that illustrate the situation and the expected changes between employers in the Herzegovina Region agribusiness in 2014 turned up. The data was statistically analyzed in a Microsoft Excel 2010 table calculator, and the results were presented in graphs and tables.

## 3.2. ANALYSIS RESULTS

The survey included 436 agribusiness employers in the Herzegovina Region out of which 92, or 21.10%, took an interview. Taking into consideration that, according to some findings, telephone interviews have up to 10% response, we can say that in our case the response was pretty good. The main reason for not getting more employers for an interview was that no contact (telephone number, fax or e-mail) was available for more than half of the selected companies in the business database or with telecom companies.

Figure 12: Interview results



Source: Author's estimation based on information obtained by conducting interviews

Out of 92 interviewed employers, 15 are registered in the RS, and 77 in the BiH Federation part of the Herzegovina Region (see Figure 13).

Figure 13: Interviewed employers in the Herzegovina Region according to entity territories



Source: Author's estimation based on information obtained by conducting interviews

Table 10: Number of interviewed employers according to the places of registered business

Municipality	Number of registered companies
City of Mostar	11
Čitluk	10
Ljubuški	10
Čapljina	9
Posušje	8
Trebinje	8
Livno	7
Grude	5
Bileća	3
Nevesinje	3
Široki Brijeg	3
Tomislavgrad	3
Jablanica	2
Konjic	2
Kupres	2
Prozor - Rama	2
Stolac	2
Ljubinje	1
Ravno	1
<b>TOTAL</b>	<b>92</b>

Source: Author's estimation based on information obtained by conducting interviews

The above table shows the number of companies that were interviewed. Most of them, 60.8%, are concentrated in the six following municipalities: City of Mostar, Čitluk, Ljubuški, Čapljina, Posušje and Trebinje, which means that there are many

agricultural activities ongoing in these areas. The remaining 39.2% interviewed companies are dispersed in 13 municipalities of the Herzegovina Region. No employers from the municipalities of Berkovići, East Mostar, Gacko and Neum were interviewed.

### 3.2.1 Ownership status

The analysis of companies in agribusiness also includes their ownership status. Most of the interviewed companies, over 70%, are privately owned. Only a small number of them are still owned by the state or are public-private partnerships, and those are mostly veterinary stations. The following graph shows the ownership status of interviewed companies.

Figure 14: Ownership status of the interviewed agribusiness companies in the Herzegovina Region

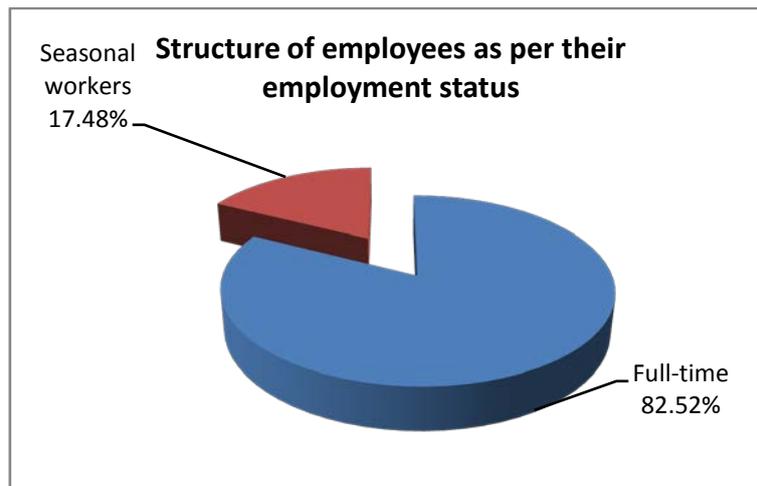


Source: Author's estimation based on information obtained by conducting interviews

### 3.2.2 Analysis of employment as per legal entity

According to the conducted interviews, there are 2,100 employees in total, out of which 1,733 (82.52%) are full-time employees and 367 (17.48%) are seasonal workers. The following graph shows the structure of employees as per their employment status.

Figure 15: The structure of employees in agribusiness as per their employment status

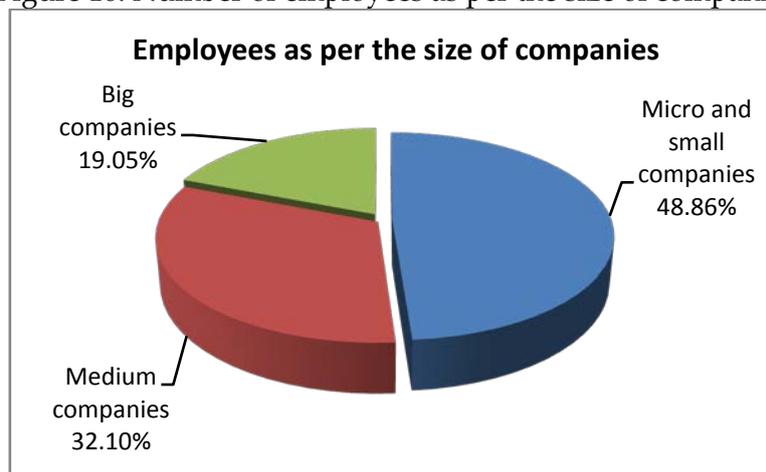


Source: Author's estimation based on information obtained by conducting interviews

If we look at the number of the employed in both entities, we see that companies in Republika Srpska employ more people than those in the BiH Federation. In fact, 15 companies included in the survey from RS employ 29% of the total number of workers.

Furthermore, if we look at the size of the companies<sup>40</sup>, most of them (86) are micro and small companies. Those micro and small companies included in the survey employ 48.86% of the total number of workers. Five medium companies absorb 32.10%, and one big company 19.05% employees. This is shown in the following graph.

Figure 16: Number of employees as per the size of companies



Source: Author's estimation based on information obtained by conducting interviews

The biggest employers are: Swiss lion d.o.o. Trebinje (400 employees), MEGGLE d.o.o. Posušje (180 employees) and ZVEČEVO-LASTA d.d. Čapljina (160

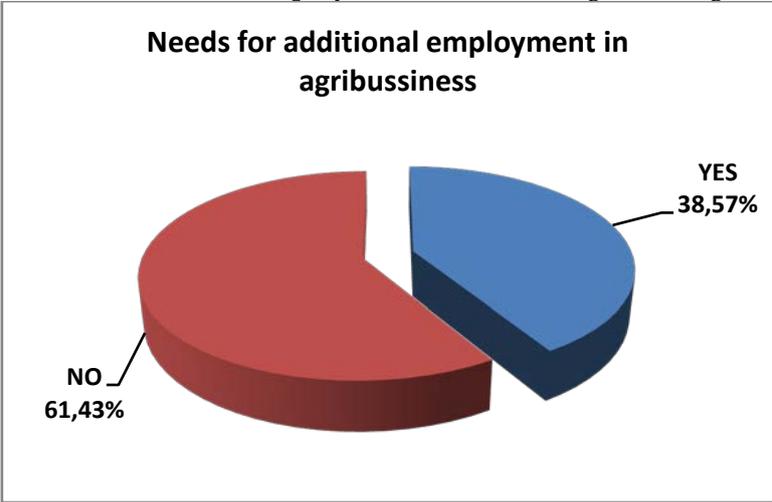
<sup>40</sup>Companies according to the size: micro (up to 10 employees), small (10 – 50), medium (50 – 250) and big (over 250 employees). Source: M. Mlinarić, K.Bačić, Development of SMEs in the F BiH 2009 – 2010; Engineering Department d.d., December 2008, page 11

employees). These three employers together generate 35.24% of jobs out of the total number of workers employed by the companies included in the survey.

### 3.2.3 Needs analysis for additional employment

The aim of this part of the analysis is to show the needs for additional employment in the Herzegovina Region agribusiness. 38 interviewed employers (38.57%) have answered positively to the question on whether they need additional workers in the forthcoming period. The disturbing fact is that 61.43% employers stated that they had no need for additional workers. The reason for it is the bad economic situation in the country.

Figure 17: Needs for additional employment in the Herzegovina region agribusiness



Source: Author's estimation based on information obtained by conducting interviews

The companies who answered to the question on additional employees positively plan to get 253 new workers in the forthcoming period. Most of the new employees will be needed in dairy production (24.9%), plant-growing and cattle breeding, hunting, and associated services (15.41%), processing and preserving of fruits and vegetables (11.85%), bakery, flour products and cakes(8.7%), unknown services<sup>41</sup> (7.5%), other food products (5.13%) and the wholesale and retail trade of agricultural raw materials and live animals (5.13%). The following table shows the needs for additional employment according to the services provided by companies.

<sup>41</sup>Out of the total number of interviewed companies, five did not answer the question on the services they provided, and three companies stated they needed to employ 19 workers.

Table 11: Review of needs for additional employment in the Herzegovina Region agribusiness according to the services provided by companies

Type of service	Number of workers needed
10.5 Dairy production	63
01 Plant-growing and cattle breeding, hunting, and associated services	39
10.3 Processing and preserving of fruits and vegetables	30
10.7 Bakery, flour products and cakes	22
* Unknown services	19
10.8 Other food products	13
46.2 Wholesale and retail trade of agricultural raw materials and live animals	13
10.6 Milling industry and corn production	10
11.02 Wine production	9
10.9 Animal feed production	8
11.0 Production of beverages	8
46.3 Wholesale of food, beverages and tobacco products	6
75 Veterinary services	6
46.61 Wholesale of agriculture machinery, equipment and tools	5
10.4 Production of vegetable and animal oil and fat	2
<b>TOTAL</b>	<b>253</b>

*Source: Author's estimation based on information obtained by conducting interviews*

It is interesting that there is less need for additional employees in the RS part of the Herzegovina Region (16.2%) than in the BiH Federation part. This is not surprising considering the fact that 83.7% of employers are situated in the BiH Federation part of the region.

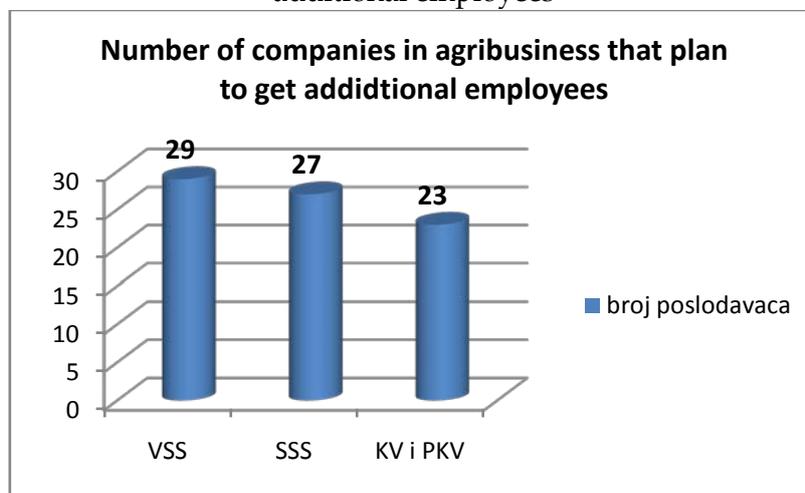
### 3.2.4 Needs analysis for specific occupations in agribusiness

The aim of this part of the analysis is to determine the number of jobs and what occupations are needed in the Herzegovina Region's agribusiness sector. During the survey, employers did not state the number of occupations or workers needed according to the level of education, and, therefore, this information will be listed per single company. The number of companies that expressed their need for particular occupations can be taken as a weight for the minimum demand of particular occupation on the agribusiness labor market in the Herzegovina Region.

According to the survey results, 29 employers, or 32% of the total that were interviewed, expressed their need for highly-educated employees. On the other side, 27 employers, or 29.54% of the total that were interviewed, expressed their need for qualified and semi-qualified workers, while 23 employers, or 25%, are ready to

takeworkers with secondary school education. The above-mentioned is shown in the following graph.

Figure 18: Number of companies in the Herzegovina Region agribusiness that plan to get additional employees



Source: Author's estimation based on information obtained by conducting interviews

The most wanted occupations in agribusiness are the following: agronomy engineers (13.04% of interviewed companies need them), various technology engineers (9.8% of interviewed companies need them) and veterinarians (7.6% of interviewed companies need them). The following table shows what other occupations are needed and the number of companies in need for those occupations.

Figure 12: Occupations and the number of interviewed companies in the Herzegovina Region agribusiness that expressed their need for those occupations

Occupation	Number of employers
agronomy engineers	12
various technology engineers	9
veterinarians	7
agriculture and chemistry technicians	6
drivers and machinery operators	6
pickers and plain labor force	5
employees with qualifications in economy	5
bakers	4
salesmen	3
warehousemen	3
butchers	3
pharmacists	2
cattle farmers	1
cooks	1
caterer	1
craftsmen	1

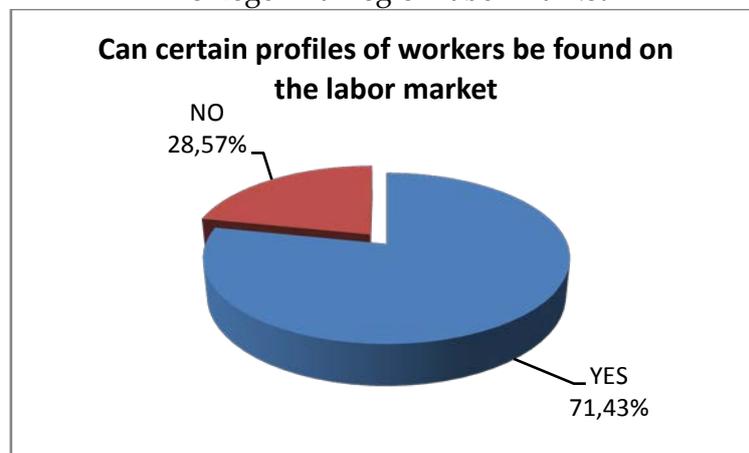
Source: Author's estimation based on information obtained by conducting interviews

### 3.2.5 Labor market supply analysis for specific skills in the Herzegovina Region Agribusiness Sector

In this chapter we will consider the quality of labor force supply in the agribusiness of the Herzegovina Region. Firstly, we will analyze whether it is possible for employers to find suitable candidates in the labor market, and then whether the employers are satisfied with their knowledge.

According to the analysis results, 71.43% of the interviewed employers answered positively to the question on the availability of workers with appropriate qualifications on the labor market, in case they need them. On the other side, 28.57% employers were not of the same opinion. The following graph shows it.

Figure 19: Views of employers on the availability of the appropriate labor force on the Herzegovina Region labor market



Source: Author's estimation based on information obtained by conducting interviews

Most of the employers who believe they can find relevant occupations on the labor market deal with the wholesale of agricultural raw materials and live animals, or they are in wine production. Out of 21 employers dealing with the above-mentioned, 19 stated that they could find relevant occupations on the Herzegovina Region labor market. It is interesting to point out that all six employers in the business of dairy production share the same opinion.

On the other hand, the employers that are not satisfied with the availability of occupations on the Herzegovina Region labor market are those dealing with in the following:

- Wholesale of food, beverages and tobacco products;
- Plant-growing and cattle breeding, hunting, and associated services; and
- Animal feed production.

The following table shows a detailed review of employers' viewpoints and opinions with regard to the availability of occupations on the Herzegovina Region labor market.

Table 13: Employers' viewpoints with regard to the availability of occupations on the Herzegovina Region labor market

Type of business	Availability of labor force		
	DA	NE	UKUPNO
46.2 Wholesale and retail trade of agricultural raw materials and live animals	10	1	11
11.02 Wine production	9	1	10
10.8 Other food products	7	1	8
10.5 Dairy production	6	0	6
75 Veterinary services	6	2	8
10.7 Bakery, flour products and cakes	5	1	6
46.3 Wholesale of food, beverages and tobacco products	5	4	9
10.3 Processing and preserving of fruits and vegetables	4	1	5
11.0 Production of beverages	4	2	6
*Unknown services	4	1	5
01 Plant-growing and cattle breeding, hunting, and associated services	3	2	5
10.9 Animal feed production	3	2	5
46.61 Wholesale of agriculture machinery, equipment and tools	3	0	3
10.1 Processing and preserving of meat and meat production	2	1	3
10.4 Production of vegetable and animal oil and fat	1	0	1
10.6 Milling industry and corn production	0	1	1
<b>TOTAL</b>	<b>72</b>	<b>20</b>	<b>92</b>

*Source: Author's estimation based on information obtained by conducting interviews*

Although most of the interviewed employers believe that relevant occupations and labor force are available in the labor market, 65.71% of them are not satisfied with the quality of their knowledge. They are also unhappy with the education system, and they think that the current education in agriculture is inefficient and that it does not generate a high-quality and competent labor force. The biggest issue is their dissatisfaction with the practical knowledge students gain during secondary and higher education, along with the fact that education institutions do not follow the demand for particular occupations.

The following graph shows the number of employers unsatisfied with the quality and level of education of labor force vs. the total number of employers that were interviewed.

Figure 20: Number of employers unsatisfied with the quality and level of education of labor force vs. the total number of employers that were interviewed



Source: Author's estimation based on information obtained by conducting interviews

The most unsatisfied are wine producers. Although they stated that they could find candidates with relevant occupations in the labor market, seven out of ten (70%) employers are unsatisfied with the quality and level of competencies of the labor force. Producers of other food products are also unsatisfied, and five out of eight (62.5%) interviewed employers are not satisfied with the quality and level of competencies of labor force. Four out of six (66.66%) interviewed among producers of beverages, dairy and bakery products producers are also unsatisfied.

On the other hand, the most satisfied employers are those who provide veterinary services. In fact, six out of seven (75%) employers are happy with the quality and level of competencies of available labor force (veterinarians).

In other businesses, the number of those satisfied and unsatisfied is more or less the same.

The following table shows in detail the number of employers satisfied vs. those unsatisfied with the quality and level of competencies of available labor force on the Herzegovina Region labor market.

Figure 14: Number of employers satisfied vs. those unsatisfied with the quality and level of competencies of available labor force on the Herzegovina Region labor market

Type of business	Satisfied with the quality of available labor force		
	Yes	No	Total
11.02 Wine production	3	7	10
10.8 Other food products	3	5	8
46.2 Wholesale and retail trade of agricultural raw materials and live animals	6	5	11
46.3 Wholesale of food, beverages and tobacco products	4	5	9
10.5 Dairy production	2	4	6
10.7 Bakery, flour products and cakes	2	4	6
10.9 Animal feed production	1	4	5
11.0 Production of beverages	2	4	6
* Unknown services	0	5	5
01 Plant-growing and cattle breeding, hunting, and associated services	2	3	5
10.1 Processing and preserving of meat and meat production	0	3	3
10.3 Processing and preserving of fruits and vegetables	3	2	5
75 Veterinary services	6	2	8
10.4 Production of vegetable and animal oil and fat		1	1
46.61 Wholesale of agriculture machinery, equipment and tools	2	1	3
10.6 Milling industry and corn production	1	0	1
<b>TOTAL</b>	<b>37</b>	<b>55</b>	<b>92</b>

## CONCLUSION

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The survey of the labor market was conducted in order to assess the current situation with regard to compliance between the education system and labor market demand in agribusiness sector.

Based on the survey carried out by using the *Desk research* method and by telephone interviews, the following conclusions were reached:

There is a great misbalance between labor force supply and demand in the agribusiness labor market. The reason for that is partly the general economic situation in the Herzegovina Region, and the structural problems are considered the biggest issue.

In 2013, the registered unemployment rate in the Herzegovina Region agribusiness sector was 38.72%. There were 1,305 unemployed persons registered, which is the highest unemployment rate in the last three years.

The decrease in the employment rate by 16.97% in the Herzegovina Region agriculture sector in the last three years is alarming.

Such trends, followed by an education system that does not include strategic planning with regard to the sector of agriculture, and 1,000 students to graduate from secondary schools and universities and get diplomas in agriculture in the next five years, additionally destabilize the labor market and cause a long-term structural misbalance between the labor force supply and demand.

Also, if we look at the survey results, we see that in the next period there will be a need for 253 new employees. On the other side, it is estimated that some 330 workers will be retired in the next ten years, and that will generate additional search for new labor. Nonetheless, although not insignificant, this level of labor demand will not be sufficient in order to stabilize the Herzegovina Region agriculture sector labor market.

Regardless of the availability of relevant occupations on the labor market, the fact that the quality and the level of competency is not yet satisfactory makes the issue of unemployment even more complex. No less than 65.71% of the interviewed employers find that the quality and the level of competency of supplied labor force on the labor market is not satisfactory.

They mention their dissatisfaction with the practical knowledge of graduates, as well as the incompliance between the education system and demand for specific occupations as the most common problem.

Such a situation could have been caused by the lack of interest and determination of students to gain sufficient knowledge, but also the bad quality of practical teaching.

### **Recommendations:**

- In order to improve the situation with regard to the practical knowledge of the labor force in the area of agriculture, the employers recommend that NGOs get actively involved and, through their informal education programs, work to strengthen the competitiveness of young people on the increasingly demanding labor market.
- It is necessary to develop strategies and carefully plan human resources in the long-term in order to control the admission quota and education programs that are to be designed in the future.
- Education policies should undergo changes and educational institutions should be a relevant actor in the development of local economy, especially in the area of agriculture.
- Use the trend of demand for bio-products and the availability of unpolluted soil in Herzegovina to secure the recognition of organic food production, which will, consequently, be able to absorb highly-educated specialists, who had an opportunity to study the production of organic food at universities in the Herzegovina Region.

## **ATTACHMENTS**

## ATTACHMENT 1: CLASSIFICATION OF OCCUPATIONS IN THE AREA OF AGRICULTURE

Standard classification of occupations in BiH, 2008		Classification of occupations in BiH, 2008	
No.	Description	Code	Description
1	Director of the production in agriculture industry	1311	DIRECTOR OF AGRICULTURE AND FOREST PRODUCTION INDUSTRY
2	Director of production in hunting/breeding industry	1311	DIRECTOR OF AGRICULTURE AND FOREST PRODUCTION INDUSTRY
3	Director of production/business manager in forest industry	1311	DIRECTOR OF AGRICULTURE AND FOREST PRODUCTION INDUSTRY
4	Director of production in fish-farming industry	1312	DIRECTOR OF FISHING AND AQUACULTURE/FISH FARMING
5	Director of production and operations unit in manufacturing industry	1321	DIRECTOR OF MANUFACTURING INDUSTRY
6	Director of a small agricultural company	1311	DIRECTOR OF AGRICULTURE AND FOREST PRODUCTION INDUSTRY
7	Director of a small vegetable-farming company	1311	DIRECTOR OF AGRICULTURE AND FOREST PRODUCTION INDUSTRY
8	Director of a small nursery-garden	1311	DIRECTOR OF AGRICULTURE AND FOREST PRODUCTION INDUSTRY
9	Director of a small company for agricultural activities	1311	DIRECTOR OF AGRICULTURE AND FOREST PRODUCTION INDUSTRY
10	Director of a small hunting/breeding company	1311	DIRECTOR OF AGRICULTURE AND FOREST PRODUCTION INDUSTRY
11	Director of a small hunting-ground	1311	DIRECTOR OF AGRICULTURE AND FOREST PRODUCTION INDUSTRY
12	Director of a small forest company	1311	DIRECTOR OF AGRICULTURE AND FOREST PRODUCTION INDUSTRY
13	Director of a small forest nursery-garden	1311	DIRECTOR OF AGRICULTURE AND FOREST PRODUCTION INDUSTRY
14	Director of a small fish-farming company	1312	DIRECTOR OF FISHING AND AQUACULTURE/FISH FARMING
15	Director of a small production company	1321	DIRECTOR OF MANUFACTURING INDUSTRY
16	Chemical engineer	2145	CHEMISTRY AND FOOD TECHNOLOGIST
17	Meat and fish processing technologist	2145	CHEMISTRY AND FOOD TECHNOLOGIST
18	Dairy products technologist	2145	CHEMISTRY AND FOOD TECHNOLOGIST
19	Milling and flour processing technologist	2145	CHEMISTRY AND FOOD TECHNOLOGIST
20	Sugar/starch/other products technologist	2145	CHEMISTRY AND FOOD TECHNOLOGIST
21	Confectionery industry technologist	2145	CHEMISTRY AND FOOD TECHNOLOGIST
22	Vegetable oil and fat production technologist	2145	CHEMISTRY AND FOOD TECHNOLOGIST

Standard classification of occupations in BiH, 2008		Classification of occupations in BiH, 2008	
No.	Description	Code	Description
23	Fruits/vegetables/soft drinks processing technologist	2145	CHEMISTRY AND FOOD TECHNOLOGIST
24	Prepared food production technologist	2145	CHEMISTRY AND FOOD TECHNOLOGIST
25	Wine/alcohol/vinegar production technologist	2145	CHEMISTRY AND FOOD TECHNOLOGIST
26	Beer production technologist	2145	CHEMISTRY AND FOOD TECHNOLOGIST
27	Cattle feed production technologist	2145	CHEMISTRY AND FOOD TECHNOLOGIST
28	Tobacco processing technologist	2145	CHEMISTRY AND FOOD TECHNOLOGIST
29	Vitamins and hormones production technologist	2145	CHEMISTRY AND FOOD TECHNOLOGIST
30	Enzyme production technologist	2145	CHEMISTRY AND FOOD TECHNOLOGIST
31	Waste-water processing technologist	2145	CHEMISTRY AND FOOD TECHNOLOGIST
32	Food-technology engineer	2145	CHEMISTRY AND FOOD TECHNOLOGIST
33	Packing technologist	2141	INDUSTRY AND PRODUCTION ENGINEERS
34	Wood-technology engineer	2141	INDUSTRY AND PRODUCTION ENGINEER
35	Kinesiologist	2250	VETERINARIAN
36	Farming agronomist	2132	ADVISOR IN AGRONOMY, FORESTRY AND FISHING INDUSTRY
37	Vegetable-growing agronomist	2132	ADVISOR IN AGRONOMY, FORESTRY AND FISHING INDUSTRY
38	Fruit-growing agronomist	2132	ADVISOR IN AGRONOMY, FORESTRY AND FISHING INDUSTRY
39	Viticulture and wine production agronomist	2132	ADVISOR IN AGRONOMY, FORESTRY AND FISHING INDUSTRY
40	Tobacco production agronomist	2145	ADVISOR IN AGRONOMY, FORESTRY AND FISHING INDUSTRY
41	Horticulture agronomist	2132	ADVISOR IN AGRONOMY, FORESTRY AND FISHING INDUSTRY
42	Plant protection agronomist	2132	ADVISOR IN AGRONOMY, FORESTRY AND FISHING INDUSTRY
43	Melioration agronomist	2132	ADVISOR IN AGRONOMY, FORESTRY AND FISHING INDUSTRY
44	Cattle-breeding agronomist	2132	ADVISOR IN AGRONOMY, FORESTRY AND FISHING INDUSTRY
45	Poultry farming agronomist	2132	ADVISOR IN AGRONOMY, FORESTRY AND FISHING INDUSTRY
46	Fish-farming agronomist	2132	ADVISOR IN AGRONOMY, FORESTRY AND FISHING INDUSTRY

Standard classification of occupations in BiH, 2008		Classification of occupations in BiH, 2008	
No.	Description	Code	Description
47	Rabbit-breeding agronomist	2132	ADVISOR IN AGRONOMY, FORESTRY AND FISHING INDUSTRY
48	Bee-breeding agronomist	2132	ADVISOR IN AGRONOMY, FORESTRY AND FISHING INDUSTRY
49	Advisory service agronomist	2132	ADVISOR IN AGRONOMY, FORESTRY AND FISHING INDUSTRY
50	Agricultural engineer	2132	ADVISOR IN AGRONOMY, FORESTRY AND FISHING INDUSTRY
51	Forestry engineer	2132	ADVISOR IN AGRONOMY, FORESTRY AND FISHING INDUSTRY
52	Hunting organizer	2132	ADVISOR IN AGRONOMY, FORESTRY AND FISHING INDUSTRY
53	Agricultural researcher	2132	ADVISOR IN AGRONOMY, FORESTRY AND FISHING INDUSTRY
54	Independent agricultural researcher	2132	ADVISOR IN AGRONOMY, FORESTRY AND FISHING INDUSTRY
55	Forestry researcher	2132	ADVISOR IN AGRONOMY, FORESTRY AND FISHING INDUSTRY
56	Independent forestry researcher	2132	ADVISOR IN AGRONOMY, FORESTRY AND FISHING INDUSTRY
57	Forestry inspector	2132	ADVISOR IN AGRONOMY, FORESTRY AND FISHING INDUSTRY
58	Agricultural inspector	2132	ADVISOR IN AGRONOMY, FORESTRY AND FISHING INDUSTRY
59	Hunting inspector	2132	ADVISOR IN AGRONOMY, FORESTRY AND FISHING INDUSTRY
60	Fishing inspector	2132	ADVISOR IN AGRONOMY, FORESTRY AND FISHING INDUSTRY
61	Veterinary surgeon	2250	VETERINARIAN
62	Animal reproduction veterinarian	2250	VETERINARIAN
63	Pet veterinarian	2250	VETERINARIAN
64	Animal healthcare veterinarian	2250	VETERINARIAN
65	General practice veterinarian	2250	VETERINARIAN
66	Veterinarian epizootiologist	2250	VETERINARIAN
67	Veterinary internist	2250	VETERINARIAN
68	Veterinarian parasitologist	2250	VETERINARIAN
69	Veterinarian microbiologist	2250	VETERINARIAN
70	Veterinarian in charge of quality and hygiene	2250	VETERINARIAN

Standard classification of occupations in BiH, 2008		Classification of occupations in BiH, 2008	
No.	Description	Code	Description
71	Veterinarian technologist in animal production	2250	VETERINARIAN
72	Veterinarian in charge of deratization/disinfection	2250	VETERINARIAN
73	Veterinarian	2250	VETERINARIAN
74	Veterinarian resident	2250	VETERINARIAN
75	Veterinary researcher	2250	VETERINARIAN
76	Independent veterinary researcher	2250	VETERINARIAN
77	Veterinary inspector	2250	VETERINARIAN
78	Agro-chemical technician	3116	CHEMICAL ENGINEERING TECHNOLOGIST
79	Meat and fish processing technician	3116	CHEMICAL ENGINEERING TECHNOLOGIST
80	Dairy products technician	3116	CHEMICAL ENGINEERING TECHNOLOGIST
81	Fruits/vegetables/soft drinks processing technician	3116	CHEMICAL ENGINEERING TECHNOLOGIST
82	Vegetable oil production technician	3116	CHEMICAL ENGINEERING TECHNOLOGIST
83	Milling and flour processing technician	3116	CHEMICAL ENGINEERING TECHNOLOGIST
84	Cattle feed production technician	3116	CHEMICAL ENGINEERING TECHNOLOGIST
85	Confectionery industry technician	3116	CHEMICAL ENGINEERING TECHNOLOGIST
86	Sugar production technician	3116	CHEMICAL ENGINEERING TECHNOLOGIST
87	Starch production technician	3116	CHEMICAL ENGINEERING TECHNOLOGIST
88	Diet production technician	3116	CHEMICAL ENGINEERING TECHNOLOGIST
89	Coffee and tea processing technician	3116	CHEMICAL ENGINEERING TECHNOLOGIST
90	Water and carbonated beverages production technician	3116	CHEMICAL ENGINEERING TECHNOLOGIST
91	Beer production technician	3116	CHEMICAL ENGINEERING TECHNOLOGIST
92	Wine production technician	3116	CHEMICAL ENGINEERING TECHNOLOGIST
93	Strong alcohol beverages production technician	3116	CHEMICAL ENGINEERING TECHNOLOGIST
94	Enzyme production technician	3116	CHEMICAL ENGINEERING TECHNOLOGIST

Standard classification of occupations in BiH, 2008		Classification of occupations in BiH, 2008	
No.	Description	Code	Description
95	Tobacco processing technician	3116	CHEMICAL ENGINEERING TECHNOLOGIST
96	Food technician	3116	CHEMICAL ENGINEERING TECHNOLOGIST
97	Food foreman	3116	CHEMICAL ENGINEERING TECHNOLOGIST
98	Wood technician	3119	CHEMICAL ENGINEERING TECHNICIANS
99	Wood processing foreman	3119	CHEMICAL ENGINEERING TECHNICIANS
100	Veterinary laboratory technician	3240	VETERINARY TECHNICIANS AND ASSISTANTS
101	Farming technician	3142	LABORATORY TECHNICIANS IN AGRICULTURE
102	Vegetable-growing technician	3142	LABORATORY TECHNICIANS IN AGRICULTURE
103	Gardening technician	3142	LABORATORY TECHNICIANS IN AGRICULTURE
104	Agricultural technician for melioration	3142	LABORATORY TECHNICIANS IN AGRICULTURE
105	Fruit-growing technician	3142	LABORATORY TECHNICIANS IN AGRICULTURE
106	Viticulture technician	3142	LABORATORY TECHNICIANS IN AGRICULTURE
107	Horticultural technician	3142	LABORATORY TECHNICIANS IN AGRICULTURE
108	Plant protection technician	3142	LABORATORY TECHNICIANS IN AGRICULTURE
109	Cattle-breeding technician	3142	LABORATORY TECHNICIANS IN AGRICULTURE
110	Poultry technician	3142	LABORATORY TECHNICIANS IN AGRICULTURE
111	Fish-farming technician	3142	LABORATORY TECHNICIANS IN AGRICULTURE
112	Agricultural technician	3142	LABORATORY TECHNICIANS IN AGRICULTURE
113	Forestry technician	3143	LABORATORY TECHNICIANS IN FORESTRY
114	Forest keeper, forest ranger	3143	LABORATORY TECHNICIANS IN FORESTRY
115	Hunting technician	3143	LABORATORY TECHNICIANS IN FORESTRY
116	Farming manager	3142	LABORATORY TECHNICIANS IN AGRICULTURE
117	Fruit-growing manager	3142	LABORATORY TECHNICIANS IN AGRICULTURE
118	Viticulture manager	3142	LABORATORY TECHNICIANS IN AGRICULTURE

Standard classification of occupations in BiH, 2008		Classification of occupations in BiH, 2008	
No.	Description	Code	Description
119	Garden manager	3142	LABORATORY TECHNICIANS IN AGRICULTURE
120	Park manager	3142	LABORATORY TECHNICIANS IN AGRICULTURE
121	Cattle-breeding manager	3142	LABORATORY TECHNICIANS IN AGRICULTURE
122	Supervisor of game/breeding site	3142	LABORATORY TECHNICIANS IN AGRICULTURE
123	Fish/shell-farming supervisor	3142	LABORATORY TECHNICIANS IN AGRICULTURE
124	Forestry manager	3143	LABORATORY TECHNICIANS IN FORESTRY
125	Hunting-ground supervisor	3143	LABORATORY TECHNICIANS IN FORESTRY
126	Agricultural technician advisor, assistant	2132	ADVISORS IN AGRONOMY, FORESTRY AND FISH-FARMING
127	Healthy food technician advisor	2265	DIET AND HEALTHY NUTRITION EXPERTS
128	Diet food technician advisor	2265	DIET AND HEALTHY NUTRITION EXPERTS
129	Veterinary technician	3240	VETERINARY TECHNICIANS AND ASSISTANTS
130	Veterinary technician for trichinosis	3240	VETERINARY TECHNICIANS AND ASSISTANTS
131	Veterinary technician for artificial insemination	3240	VETERINARY TECHNICIANS AND ASSISTANTS
132	Veterinary technician for animal immunization	3240	VETERINARY TECHNICIANS AND ASSISTANTS
133	Veterinary technician for deratization	3240	VETERINARY TECHNICIANS AND ASSISTANTS
134	Farmer	6111	FARMERS AND VEGETABLE GROWERS
135	Fruit-grower	6112	GROWERS OF TREES AND UNDERBRUSH
136	Wine-grower	6112	GROWERS OF TREES AND UNDERBRUSH
137	Wine-maker	6112	GROWERS OF TREES AND UNDERBRUSH
138	Nursery-gardener	6114	GROWERS OF DIFFERENT PLANTS
139	Irrigation farmer	6111	FARMERS AND VEGETABLE GROWERS
140	Gardener	6113	GARDENERS AND PLANT GROWERS
141	Gardener/specialist	6113	GARDENERS AND PLANT-GROWERS
142	Park gardener	6113	GARDENERS AND PLANT-GROWERS

Standard classification of occupations in BiH, 2008		Classification of occupations in BiH, 2008	
No.	Description	Code	Description
143	Plantation gardener	6113	GARDENERS AND PLANT-GROWERS
144	Florist	6112	GROWERS OF TREES AND UNDERBRUSH
145	Florist-arranger	6112	GROWERS OF TREES AND UNDERBRUSH
146	Mushroom-grower	6111	FARMERS AND VEGETABLE GROWERS
147	Herb-grower	6112	GROWERS OF TREES AND UNDERBRUSH
148	Seeds man	6113	GARDENERS AND PLANT-GROWERS
149	Cow-breeder	6121	CATTLE-BREEDERS
150	Handler of lacto freezer	6121	CATTLE-BREEDERS
151	Sheep-breeder	6121	CATTLE-BREEDERS
152	Goat-breeder	6121	CATTLE-BREEDERS
153	Horse-breeder	6121	CATTLE-BREEDERS
154	Pig-breeder	6121	CATTLE-BREEDERS
155	Cattle-breeder	6121	CATTLE-BREEDERS
156	Horse trainer	6121	CATTLE-BREEDERS
157	Poultry farmer	6122	PERADARI POULTRY FARMERS
158	Breeder of other animals	6129	ANIMAL-FARMERS
159	Assistant animal-breeder	6129	ANIMAL- FARMERS
160	Snail-breeder	6129	ANIMAL- FARMERS
161	Frog-breeder	6129	ANIMAL- FARMERS
162	Worm-breeder	6129	ANIMAL- FARMERS
163	Dog-breeder	6129	ANIMAL- FARMERS
164	Cat-breeder	6129	ANIMAL- FARMERS
165	Fur-animal breeder	6129	ANIMAL- FARMERS
166	Rabbit-breeder	6129	ANIMAL- FARMERS

Standard classification of occupations in BiH, 2008		Classification of occupations in BiH, 2008	
No.	Description	Code	Description
167	Bird-breeder	6129	ANIMAL- FARMERS
168	Laboratory animal-breeder	6129	ANIMAL- FARMERS
169	Aquarium fish-breeder	6129	ANIMAL- FARMERS
170	Game-breeder	6129	ANIMAL- FARMERS
171	Forest furry game-breeder	6129	ANIMAL- FARMERS
172	Forest feathery game-breeder	6129	ANIMAL- FARMERS
173	Beekeeper	6123	BEEKEEPERS, SILK-WORM-BREEDERS
174	Silk-worm-breeder	6123	BEEKEEPERS, SILK-WORM-BREEDERS
175	Falconer	6129	ANIMAL- FARMERS
176	Farmer and cattle-breeder	6130	FARMERS OF DIFFERENT CROPS AND ANIMAL BREEDERS
177	Forest nursery-gardener	6210	FORESTERS AND ASSOCIATED OCCUPATIONS
178	Forest cultivator	6210	FORESTERS AND ASSOCIATED OCCUPATIONS
179	Woodcutter	6210	FORESTERS AND ASSOCIATED OCCUPATIONS
180	Firewood sawyer	6210	FORESTERS AND ASSOCIATED OCCUPATIONS
181	Forest wood measurer	6210	FORESTERS AND ASSOCIATED OCCUPATIONS
182	Forest fire monitor	6210	FORESTERS AND ASSOCIATED OCCUPATIONS
183	Management measures implementation operator	6210	FORESTERS AND ASSOCIATED OCCUPATIONS
184	Horticulture technician	3142	LABORATORY TECHNICIANS IN AGRICULTURE
185	Charcoal burner	6210	FORESTERS AND ASSOCIATED OCCUPATIONS
186	Forest worker on wood distillation using traditional technique	6210	FORESTERS AND ASSOCIATED OCCUPATIONS
187	Fish/shell-farmer	6221	FORESTERS AND ASSOCIATED OCCUPATIONS
188	Fish-farmer	6221	FORESTERS AND ASSOCIATED OCCUPATIONS
189	Fish larva-farmer	6221	FORESTERS AND ASSOCIATED OCCUPATIONS
190	Hatchery farmer	6221	FORESTERS AND ASSOCIATED OCCUPATIONS

Standard classification of occupations in BiH, 2008		Classification of occupations in BiH, 2008	
No.	Description	Code	Description
191	River and lake fisherman	6222	COASTAL FISHERMEN AND ASSOCIATED OCCUPATIONS
192	Sea fisherman	6222	COASTAL FISHERMEN AND ASSOCIATED OCCUPATIONS
193	Hunter	6224	HUNTERS AND ASSOCIATED OCCUPATIONS
194	Butcher manager	7511	BUTCHERS AND ASSOCIATED OCCUPATIONS
195	Butcher	7511	BUTCHERS AND ASSOCIATED OCCUPATIONS
196	Master butcher	7511	BUTCHERS AND ASSOCIATED OCCUPATIONS
197	Sausage-maker	7511	BUTCHERS AND ASSOCIATED OCCUPATIONS
198	Bakery manager	7512	BAKERS, PASTRYCOOKS AND ASSOCIATED OCCUPATIONS
199	Baker	7512	BAKERS, PASTRYCOOKS AND ASSOCIATED OCCUPATIONS
200	Master baker	7512	BAKERS, PASTRYCOOKS AND ASSOCIATED OCCUPATIONS
201	Meat-pie and pizza baker	7512	BAKERS, PASTRYCOOKS AND ASSOCIATED OCCUPATIONS
202	Pastry cook	7512	BAKERS, PASTRYCOOKS AND ASSOCIATED OCCUPATIONS
203	Master pastry cook	7512	BAKERS, PASTRYCOOKS AND ASSOCIATED OCCUPATIONS
204	Gingerbread man	7512	BAKERS, PASTRYCOOKS AND ASSOCIATED OCCUPATIONS
205	Pasta maker	7512	BAKERS, PASTRYCOOKS AND ASSOCIATED OCCUPATIONS
206	Milk quality supervisor	7513	MILK PRODUCERS
207	Milkman	7513	MILK PRODUCERS
208	Master milkman	7513	MILK PRODUCERS
209	Cheese maker	7513	MILK PRODUCERS
210	Butter maker	7513	MILK PRODUCERS
211	Ice-cream maker	7513	MILK PRODUCERS
212	Fruits and vegetables producer	7514	FRUITS AND VEGETABLES PRODUCERS AND ASSOCIATED OCCUPATIONS
213	Edible oil producer	7514	FRUITS AND VEGETABLES PRODUCERS AND ASSOCIATED OCCUPATIONS
214	Alcohol beverages producer	7514	FRUITS AND VEGETABLES PRODUCERS AND ASSOCIATED OCCUPATIONS

Standard classification of occupations in BiH, 2008		Classification of occupations in BiH, 2008	
No.	Description	Code	Description
215	Non-alcoholic drinks producer	7514	FRUITS AND VEGETABLES PRODUCERS AND ASSOCIATED OCCUPATIONS
216	Vinegar producer	7514	FRUITS AND VEGETABLES PRODUCERS AND ASSOCIATED OCCUPATIONS
217	Food taster	7515	FOOD RATERS AND TASTERS
218	Drink taster	7515	FOOD RATERS AND TASTERS
219	Wine-maker	7515	FOOD RATERS AND TASTERS
220	Food rater	7515	FOOD RATERS AND TASTERS
221	Drink rater	7515	FOOD RATERS AND TASTERS
222	Meat-treatment equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
223	Fish-treatment equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
224	Fat-rendering equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
225	Meat-drying equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
226	Meat/fish-freezing equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
227	Meat/fish can sterilization equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
228	Sausage equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
229	Meat-processing equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
230	Fish-processing equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
231	Meat/fish preservation equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
232	Fish products machine operator	8160	FOOD PRODUCTION PLANTS OPERATORS
233	Meat/fish-processing machine-tender	8160	FOOD PRODUCTION PLANTS OPERATORS
234	Milk-treatment machine operator	8160	FOOD PRODUCTION PLANTS OPERATORS
235	Milk-pasteurization machine operator	8160	FOOD PRODUCTION PLANTS OPERATORS
236	Milk preservation machine operator	8160	FOOD PRODUCTION PLANTS OPERATORS
237	Specialized industrial milk treater	8160	FOOD PRODUCTION PLANTS OPERATORS
238	Milk-processing plant operator	8160	FOOD PRODUCTION PLANTS OPERATORS

Standard classification of occupations in BiH, 2008		Classification of occupations in BiH, 2008	
No.	Description	Code	Description
239	Dairy baby food production plant operator	8160	FOOD PRODUCTION PLANTS OPERATORS
240	Dairy products cooling equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
241	Dairy products pasteurization equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
242	Dairy products equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
243	Industrial cheese maker	8160	FOOD PRODUCTION PLANTS OPERATORS
244	Specialized milk processor	8160	FOOD PRODUCTION PLANTS OPERATORS
245	Milk-processing machine-tender	8160	FOOD PRODUCTION PLANTS OPERATORS
246	Wheat-husking equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
247	Wheat-milling equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
248	Mill-colander operator	8160	FOOD PRODUCTION PLANTS OPERATORS
249	Mill-roller operator	8160	FOOD PRODUCTION PLANTS OPERATORS
250	Condiment-mill operator	8160	FOOD PRODUCTION PLANTS OPERATORS
251	Silos equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
252	Food-grinding machine-tender	8160	FOOD PRODUCTION PLANTS OPERATORS
253	Cattle feed production equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
254	Diet food production equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
255	Dought production equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
256	Wheat products equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
257	Bakery equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
258	Pasta production equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
259	Biscuit production equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
260	Delicatessen and pastry equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
261	Cake production equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
262	Sweets production equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS

Standard classification of occupations in BiH, 2008		Classification of occupations in BiH, 2008	
No.	Description	Code	Description
263	Chocolate production equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
264	Bakery products and sweets machine-tender	8160	FOOD PRODUCTION PLANTS OPERATORS
265	Fruits and vegetables washing equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
266	Fruits and vegetables preparation equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
267	Fruits and vegetables-drying equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
268	Fruits and vegetables-freezing equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
269	Fruits and vegetables can sterilization equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
270	Fruit-treatment equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
271	Fruits and vegetables-processing equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
272	Fruit nectar production equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
273	Fruit baby food equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
274	Oil crops husk-milling equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
275	Oil seed-milling equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
276	Edible oil production equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
277	Oil and fat refinement equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
278	Margarine and vegetable fat production equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
279	Fruits and vegetables-processing machine-tender	8160	FOOD PRODUCTION PLANTS OPERATORS
280	Food equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
281	Sugar beet-cutting plant operator	8160	FOOD PRODUCTION PLANTS OPERATORS
282	Sugar extraction plant operator	8160	FOOD PRODUCTION PLANTS OPERATORS
283	Sugar syrups-filtrating plant operator	8160	FOOD PRODUCTION PLANTS OPERATORS
284	Sugar-crystallization plant operator	8160	FOOD PRODUCTION PLANTS OPERATORS
285	Liquid sugar plant operator	8160	FOOD PRODUCTION PLANTS OPERATORS
286	Sterilization and transport equipment plant operator	8160	FOOD PRODUCTION PLANTS OPERATORS

Standard classification of occupations in BiH, 2008		Classification of occupations in BiH, 2008	
No.	Description	Code	Description
287	Sugar and noodle-drying plant operator	8160	FOOD PRODUCTION PLANTS OPERATORS
288	Starch separation plant operator	8160	FOOD PRODUCTION PLANTS OPERATORS
289	Corn syrup extraction plant operator	8160	FOOD PRODUCTION PLANTS OPERATORS
290	Starch refinement plant operator	8160	FOOD PRODUCTION PLANTS OPERATORS
291	Gluten extraction plant operator	8160	FOOD PRODUCTION PLANTS OPERATORS
292	Starch derivatives production plant operator	8160	FOOD PRODUCTION PLANTS OPERATORS
293	Honey-processing plant operator	8160	FOOD PRODUCTION PLANTS OPERATORS
294	Specialized producer of curative honey products	8160	FOOD PRODUCTION PLANTS OPERATORS
295	Sugar production machine-tender	8160	FOOD PRODUCTION PLANTS OPERATORS
296	Coffee/instant coffee and tea preparation plant operator	8160	FOOD PRODUCTION PLANTS OPERATORS
297	Coffee/cocoa/food additive and tea-processing plant operator	8160	FOOD PRODUCTION PLANTS OPERATORS
298	Barley and malt treatment equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
299	Beer production plant operator	8160	FOOD PRODUCTION PLANTS OPERATORS
300	Wine production equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
301	Alcohol production equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
302	Strong alcohol beverages production equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
303	Non-alcoholic beverages production equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
304	Vinegar production plant operator	8160	FOOD PRODUCTION PLANTS OPERATORS
305	Yeast production equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
306	Beverage production equipment operator	8160	FOOD PRODUCTION PLANTS OPERATORS
307	Beverage production machine-tender	8160	FOOD PRODUCTION PLANTS OPERATORS
308	Packing equipment operator	8183	PACKING, BOTTLING AND LABELING EQUIPMENT OPERATORS
309	Goods-labeling operator	8183	PACKING, BOTTLING AND LABELING EQUIPMENT OPERATORS
310	Finance labels operator	8183	PACKING, BOTTLING AND LABELING EQUIPMENT OPERATORS

Standard classification of occupations in BiH, 2008		Classification of occupations in BiH, 2008	
No.	Description	Code	Description
311	Hermetic-sealing equipment operator	8183	PACKING, BOTTLING AND LABELING EQUIPMENT OPERATORS
312	Bottle-washing equipment operator	8183	PACKING, BOTTLING AND LABELING EQUIPMENT OPERATORS
313	Bottle-filling equipment operator	8183	PACKING, BOTTLING AND LABELING EQUIPMENT OPERATORS
314	Pressure-packing equipment operator	8183	PACKING, BOTTLING AND LABELING EQUIPMENT OPERATORS
315	Gas-filled bottles equipment operator	8183	PACKING, BOTTLING AND LABELING EQUIPMENT OPERATORS
316	Pill-packing equipment operator	8183	PACKING, BOTTLING AND LABELING EQUIPMENT OPERATORS
317	Agricultural tractor driver	8341	AGRICULTURAL AND FORESTRY MACHINERY DRIVERS
318	Forest tractor driver	8341	AGRICULTURAL AND FORESTRY MACHINERY DRIVERS
319	Agricultural machinery driver	8341	AGRICULTURAL AND FORESTRY MACHINERY DRIVERS
320	Heavy forest machinery driver	8341	AGRICULTURAL AND FORESTRY MACHINERY DRIVERS

## ATTACHEMENT 2: SAMPLE OF THE SECONDARY AGRICULTURAL SCHOOLS CURRICULA IN THE HERZEGOVINA REGION

No.	COURSE				
		1 <sup>st</sup> class	2 <sup>nd</sup> class	3 <sup>rd</sup> class	4 <sup>th</sup> class
1.	Croatian/Bosnian	3	3	3	3
2.	Foreign language	2	2	2	2
3.	History	2	2	-	-
4.	Geography	2	1	-	-
5.	Physical culture	2	2	2	2
6.	Politics and economy	-	-	-	2
7.	Ethics/religious teaching	1	1	1	1
8.	Mathematics	2	2	2	2
9.	Physics	2	2	-	-
10.	Chemistry	2	2	-	-
11.	Biology	-	2	-	-
12.	Computer science	-	2	2	-
13.	Agricultural botanic	2	-	-	-
14.	Basis of plant production	2	-	-	-
15.	Land and land restructuring	2	-	-	-
16.	Farming	-	2	2	2
17.	Cattle-breeding	2	2	2	2
18.	Fruit-growing	-	-	2	2
19.	Wine-growing	-	-	2	-
20.	Vegetable-growing	-	-	2	-
21.	Wine production	-	-	-	2
22.	Agricultural machinery	-	2	2	2
23.	Plant protection	-	-	2	2
24.	Market	-	-	-	2
25.	Traffic and driving	-	-	1	-
26.	Elective subject	2 <sup>1</sup>	1 <sup>1</sup>	1 <sup>1</sup>	2 <sup>1</sup>
27.	Practical course	4	4	4	4
<b>TOTAL SPECIALIZED CLASSES</b>		<b>14</b>	<b>11</b>	<b>20</b>	<b>20</b>
<b>GRAND TOTAL</b>		<b>32</b>	<b>32</b>	<b>32</b>	<b>32</b>
<b>PRACTICE(total per year)</b>		<b>80<sup>2</sup></b>	<b>80<sup>2</sup></b>	<b>80<sup>2</sup></b>	<b>40<sup>3</sup></b>

**ATTACHEMENT 3: STUDY CURRICULUM OF THE UNIVERSITY  
„DŽEMAL BIJEDIĆ“ MOSTAR FACULTY OF AGRICULTURE AND  
MEDITERANEAN SCIENCES**

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**Vegetable and flower-growing**

	Course	Year	Sem	ECTS	P	V
I-1	Agricultural ecology	1		5		
I-2	Agricultural Meteorology	1		5		
I-3	Biochemistry	1		5		
I-4	Botany	1		5		
I-5	Plant breeding	1		5		
I-6	Mathematics and statistics	1		5		
I-7	Microbiology in agriculture	1		5		
I-8	General and inorganic chemistry	1		5		
I-9	Organic chemistry	1		5		
I-10	Bases of computer science	1		5		
I-11	Pedology	1		5		
I-12	Systematic of plants	1		5		
	Course	Year	Sem	ECTS	P	V
II-1	Agrar policy and legislation	2		3		
II-2	Vegetable genetic resources	2		3		
II-3	Biotechnology and genetic engineering	2		3		
II-4	Physiology of plants	2		5		
II-5	Genetics	2		5		
II-6	Mushroom-growing	2		3		
II-7	Land/soil chemistry	2		3		
II-8	Water chemistry	2		3		
II-9	Hydroponic methods of production	2		3		
II-10	Bases of agricultural mechanization	2		5		
II-11	Bases of fitomedicine	2		5		
II-12	Bee-breeding	2		3		
II-13	Transplanting	2		5		
II-14	Physical culture	2		0		
II-15	Land restructuring and irrigation	2		5		
II-A.16	Harvest, packing and preservation of vegetables and flowers	2		3		
II-A.17	Ferti-irrigation of vegetables and flowers	2		3		
II-A.18	History of landscape agriculture	2		3		
II-A.19	Mechanization of vegetable-flower production	2		3		
II-A.20	Flower-growing	2		5		
II-A.21	Vegetable-growing	2		5		
II-A.22	Production of organic vegetables	2		3		
II-A.23	Park dentrology	2		3		
II-A.24	Building and maintaining of lawns	2		3		

II-A.25	Tobacco production and processing	2		3		
II-A.26	Special flower-growing	2		5		
II-A.27	Special vegetable-growing	2		5		
	Course	Year	Sem	ECTS	P	V
III-1	Economy of agricultural production	3		5		
III-2	Work methods of advisory service	3		3		
III-3	Bases of environmental protection	3		3		
III-4	Small business in agriculture	3		3		
III-5	Practice	3		10		
III-6	Household management	3		5		
III-A.7	Integrated vegetable production	3		3		
III-A.8	Mediterranean, herbal and condiment plants	3		5		
III-A.9	Plant protection	3		5		
III-A.10	Building and maintenance of green areas	3		3		
III-A.11	Vegetable production for processing	3		3		
III-A.12	Production in protected areas	3		5		
III-A.13	Production of leaf vegetables	3		3		
III-A.14	Vegetable-processing technology	3		5		
III-A.15	Cut flower production technology	3		3		
III-A.16	Season flowers production technology	3		3		
III-A.17	Protection of vegetables and flowers	3		5		

### Fruit and wine-growing

	Course	Year	Sem	ECTS	P	V
I-1	Agricultural ecology	1		5		
I-2	Agricultural Meteorology	1		5		
I-3	Biochemistry	1		5		
I-4	Botany	1		5		
I-5	Plant breeding	1		5		
I-6	Mathematics and statistics	1		5		
I-7	Microbiology in agriculture	1		5		
I-8	General and inorganic chemistry	1		5		
I-9	Organic chemistry	1		5		
I-10	Bases of computer science	1		5		
I-11	Pedology	1		5		
I-12	Systematic of plants	1		5		
	Course	Year	Sem	ECTS	P	V
II-1	Agrar policy and legislation	2		3		
II-2	Plant genetic resources	2		3		
II-3	Biotechnology and genetic engineering	2		3		
II-4	Physiology of plants	2		5		
II-5	Genetics	2		5		
II-6	Mushroom-growing	2		3		
II-7	Land/soil chemistry	2		3		

II-8	Water chemistry	2		3		
II-9	Hydroponic methods of production	2		3		
II-10	Bases of agricultural mechanization	2		5		
II-11	Bases of fitomedicine	2		5		
II-12	Bee-breeding	2		3		
II-13	Transplanting	2		5		
II-14	Physical culture	2		0		
II-15	Land restructuring and irrigation	2		5		
II-B.16	Harvest, packing and preservation of vegetables and flowers	2		3		
II-B.17	Ferti-irrigation of vegetables and flowers	2		3		
II-B.18	History of landscape agriculture	2		3		
II-B.19	Mechanization of vegetable-flower production	2		3		
II-B.20	Flower-growing	2		5		
II-B.21	Vegetable-growing	2		5		
II-B.22	Production of organic vegetables	2		3		
II-B.23	Park dentrology	2		3		
II-B.24	Building and maintaining of lawns	2		3		
	Course	Year	Sem	ECTS	P	V
III-1	Economy of agricultural production	3		5		
III-2	Work methods of advisory service	3		3		
III-3	Bases of environmental protection	3		3		
III-4	Starting small businesses in agriculture	3		3		
III-5	Practice	3		10		
III-6	Household management	3		5		
III-B.7	Integrated vegetable production	3		3		
III-B.8	Mediterranean, herbal and condiment plants	3		5		
III-B.9	Plant protection	3		5		
III-B.10	Building and maintenance of green areas	3		3		
III-B.11	Vegetable production for processing	3		3		
III-B.12	Production in protected areas	3		5		
III-B.13	Production of leaf vegetables	3		3		
III-B.14	Vegetable-processing technology	3		5		
III-B.15	Cut flower production technology	3		3		
III-B.16	Seasonal flowers production technology	3		3		
III-B.17	Protection of vegetables and flowers	3		5		

## ATTACHEMENT 4: STUDY CURRICULUM OF THE UNIVERSITY OF MOSTAR FACULTY OF AGRICULTURE AND FOOD-TECHNOLOGY

### AGRONOMY STUDIES (BA degree)

No.	Status	Course	NUMBER OF CLASSES			ECTS
			P	V	S	
1.	T*	CHEMISTRY	30	30		6
2.	T	ANIMAL-BREEDING	30	30		6
3.	T	AGRICULTURAL ZOOLOGY	28	24	8	6
4.	T	MATHEMATICS	15	15		3
5.	T	COMPUTER SCIENCE IN AGRICULTURE	10	20		3
6.	T	PHYSICAL CULTURE		30		0
7.	T	BASES OF AGRICULTURAL ECONOMICS	30	20	10	6
TOTAL			143	139	18	<b>30</b>
<b>GRAND TOTAL</b>			<b>330</b>			
No.	Status	Course	NUMBER OF CLASSES			ECTS
			P	V	S	
1.	T	FOREIGN LANGUAGE	30			0
2.	T	BIOCHEMISTRY	20	10		3
3.	T	BASES OF PLANT-FROWING	45	12	3	6
4.	T	AGRICULTURAL BOTANIC	30	30		6
5.	T	BIOMETRICS	29	26	5	6
6.	T	MICROBIOLOGY	24	6		3
7.	T	BASES OF AGRICULTURALENGINEERING	22	8		3
8.	T	AGRICULTURAL CLIMATOLOGY	20	10		3
TOTAL			220	102	8	<b>30</b>
<b>GRAND TOTAL</b>			<b>330</b>			
No.	Status	Course	NUMBER OF CLASSES			ECTS
			P	V	S	
1.	O*	PEDOLOGY	39	20	1	6
2.	O	GENETICS	36	24		6
3.	O	PHYSIOLOGY OF PLANTS	30	30		6
4.	O	MELIORATIONS	20	10		3
5.	O	ANATOMY AND PHYSIOLOGY OF DOMESTIC ANIMALS	48	12		6
6.	O	VEGETABLE-GROWING	20	10		3
TOTAL			193	106	1	<b>30</b>
<b>GRAND TOTAL</b>			<b>300</b>			
No.	Status	Course	NUMBER OF CLASSES			ECTS
			P	V	S	
1.	O	FRUIT-GROWING	15	15		3
2.	O	VITICULTURE	15	10	5	3
3.	O	VEGETABLE-GROWING	30	30		6
4.	O	SPECIALIZED FARMING	30	28	2	6
5.	O	AGRICULTURAL MEHANIZATION	25	5		3
6.	O	PLANT SELECTION	40	15	5	6
7.	O	WINE PRODUCTION	15	15		3
TOTAL			170	118	12	<b>30</b>

GRAND TOTAL			300			
No.	Status	Course	NUMBER OF CLASSES			ECTS
			P	V	S	
1.	O	PLANT SELECTION	44	12	4	6
2.	O	CATTLE-GROWING	30	30		6
3.	O	FISH-FARMING	15	15		3
4.	O	PHYTOPATHOLOGY	24	6		3
5.	O	SPECIALIZED FRUIT-GROWING	15	15		3
6.	O	ENTOMOLOGY	25	5		3
7.	O	PHYTOPHARMACY	18	12		3
8.	O	HEALTH CARE OF DOMESTIC ANIMALS	15	15		3
TOTAL			186	110	4	30
GRAND TOTAL			300			
No.	Status	Course	NUMBER OF CLASSES			ECTS
			P	V	S	
1.	IS*	BASES OF AGRICULTURAL EKOLOGY AND ENVIRONMENT PROTECTION	18	8	4	3
2.	IS	PROCEDURES AND EQUIPMENT IN THE FINALIZATION OF AGRICULTURAL PRODUCTS	36	20	4	6
3.	IS	MARKETING OF AGRICULTURAL PRODUCTS	15	15		3
4.	IS	MEDITERANNEAN FRUIT-GROWING	15	15		3
5.	IS	COST ANALYSIS	15	15		3
6.	IS	QUALITY AND MEAT-PROCESSING	15	15		3
7.	IS	INTRODUCTION TO EKOLOGICAL AGRICULTURE	14	8	8	3
8.	IS	BEE-BREEDING	15	15		3
9.	IS	DAIRY PRODUCTION	32	20	8	6
10.	IS	DOMECTIC ANIMAL FEED	40	20		6
11.	IS	ORGANOIZATION AND MANAGEMENT OF FARMS	15	12	3	3
12.	IS	SEED PRODUCTION AND TRANSPLANTING	44	8	8	6
13.	IS	ENVIRONMENTAL MANAGEMENT	30	20	10	6
14.	IS	WASTE-MANAGEMENT	30	20	10	6
15.	IS	REPRODUCTION OF DOMESTIC ANIMALS	20	5	5	3

### FOOD TECHNOLOGY STUDIES (BA degree)

No.	Status	Course	NUMBER OF CLASSES			ECTS
			P	V	S	
1.	OB*	CHEMISTRY I	60	30	30	10
2.	OB	MATHEMATICS I	45	30		6
3.	OB	TECHNICAL PHYSICS	45	15	15	6
4.	OB	BIOLOGY	45	30		6
5.	OB	FOREIGN LANGUAGE I	15	15		2
6.	OB	PHYSICAL AND HEALTH CULTURE		30		
TOTAL			210	150	45	30
GRAND TOTAL			405			

No.	Status	Course	NUMBER OF CLASSES			ECTS
			P	V	S	
1.	OB	CHEMISTRY II	45	45	15	8
2.	OB	MATHEMATICS II	30	30		5
3.	OB	ENGINEERING THERMODYNAMICS	45	30		6
4.	OB	MACHINES	45	30		6
5.	OB	BASES OF COMPUTER SCIENCE	30	15		3
6.	OB	FOREIGN LANGUAGE II	15	15		2
7.	OB	PHYSICAL AND HEALTH CULTURE		30		
TOTAL			210	195	15	30
GRAND TOTAL			390			
No.	Status	Course	NUMBER OF CLASSES			ECTS
			P	V	S	
1.	OB	PHYSICAL CHEMISTRY	45	30		5,5
2.	OB	MICROBIOLOGY	45	30		5,5
3.	OB	ENGINEERING	60	30		7
4.	OB	BIOCHEMISTRY	60	30		7
5.	OB	BIOSTATISTICS	15	15		3
6.	OB	FOREIGN LANGUAGE III	15	15		2
7.	OB	PHYSICAL AND HEALTH CULTURE		30		
TOTAL			240	180		30
GRAND TOTAL			420			
No.	Status	Course	NUMBER OF CLASSES			ECTS
			P	V	S	
1.	OB	FOOD SCIENCE	45			4,5
2.	OB	MICROBIOLOGY OF FOOD	45	30		5,5
3.	OB	FOOD QUALITY CONTROL	45	45		6
4.	OB	PACKAGING AND PACKING OF FOOD	30	15		3
5.	OB	RAW MATERIALS OF ANIMAL ORIGIN	30	15		3
6.	OB	RAW MATERIALS OF PLANT ORIGIN	45	15		5
7.	OB	INSTRUMENTAL ANALYSIS METHOD I	30	15		3
8.	OB	PHYSICAL AND HEALTH CULTURE		30		
TOTAL			270	165		30
GRAND TOTAL			435			
No.	Status	Course	NUMBER OF CLASSES			ECTS
			P	V	S	
1.	OB	FOOD INDUSTRY PROCESSES	45	30	15	7
2.	OB	WATER TECHNOLOGY AND WASTE-WATER TREATMENT	45	15		5
3.	OB	FOOD CHEMISTRY	45	15		5
4.	OB	MEASUREMENT AND MANAGEMENT OF PROCESSES	45	15		5
5.	OB	HYGIENE AND SANITATION	30	30		4
6.	OB	PRACTICE		90		4
TOTAL			210	195	15	30
GRAND TOTAL			420			
No.	Status	Course	NUMBER OF CLASSES			ECTS
			P	V	S	

1.	OB	TECHNOLOGICAL DESIGN I	30	30		4
2.	OB	TECHNOLOGY OF PLANT ORIGIN RAW MATERIALS-PROCESSING	75	30		8
3.	OB	TECHNOLOGY OF ANIMAL ORIGIN RAW MATERIALS-PROCESSING	45	30		4
4.	IS*	ELECTIVE SUBJECT I				min.14
5.	IS	ELECTIVE SUBJECT II				
6.	IS	ELECTIVE SUBJECT III				
7.	IS	ELECTIVE SUBJECT IV				
						<b>30</b>
No.	Status	Course	NUMBER OF CLASSES			ECTS
			P	V	S	
1.	IS*	WINE TECHNOLOGY	45	30		6
2.	IS	PRODUCTION OF STRONG ALCOHOL BEVERAGES	60	15	15	4
3.	IS	CONDIMENTS AND AROMATIC PLANTS	30	15		2
4.	IS	MANAGEMENT OF FOOD QUALITY AND SECURITY	30	15		4
5.	IS	ECOLOGY	20	10		2
6.	IS	MARKETING OF FOOD PRODUCTS	20	10		2
7.	IS	FOOD INDUSTRY ECONOMY	20	10		2
8.	IS	SENSOR ANALYSIS	20	10		2
9.	IS	FOOD TOXICOLOGY	20	10		2

## ATTACHEMENT 5: QUESTIONNAIRE

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### QUESTIONNAIRE FOR EMPLOYERS IN THE HERZEGOVINA REGION AGRIBUSINESS SECTOR 10 March 2014

Company: \_\_\_\_\_ Location: \_\_\_\_\_

Ownership type:    1. Private    2. State-owned    3. Public-private partnership  
                          4. Other \_\_\_\_\_

1. How many employees do you have (including seasonal workers)?

\_\_\_\_\_

2. Do you need additional employees? If yes, how many workers you plan to get in the next two years?

a. YES, I plan to get \_\_\_\_\_ workers.

b. NO

**Comment:**

3. What kind of profile/qualifications you need the most (please state the level of education and occupations)?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. Are workers with the right profiles and skills you need available on the labor market?

a. YES            b. NO

**Comment:**

5. Do you find that the present secondary and university education systems provides adequate education in the area of agriculture?

a. YES    b. NO

**Comment:**

THANK YOU!

## ATTACHEMENT 6: DATABASE OF THE INTERVIEWED EMPLOYERS IN THE HERZEGOVINA REGION AGRIBUSINESS INDUSTRY

No.	Name	Location	Area of work/Business classification, BiH 2010	Ownership type
1	LI- PEK d.o.o.	Livno	10.7 Bakery, flour products and cakes	Private
2	BIVIS d.o.o.	Livno	11.0 Production of beverages	Private
3	DAVOR d.o.o	Livno	*	Private
4	DAN & CO d.o.o.	Livno	46.2 Wholesale of agriculture row materials and live animals	Private
5	GRAMINEA d.o.o.	Livno	46.2 Wholesale of agriculture row materials and live animals	Private
6	MLJEKARA SUŠA d.o.o.	Livno	10.5 Dairy production	Private
7	Veterinarska stanica "LI VET"	Livno	75. Veterinary service	Private
8	PP KUPREŠKO POLJE d.o.o.	Kupres	01 Plant-growing, cattle breeding, hunting, and associated services	State-owned
9	GAJEVINE - DUŠIĆI d.o.o.	Kupres	01 Plant-growing, cattle breeding, hunting, and associated services	Private
10	VOĆE GOLD d.o.o.	Čapljina	10.3 Processing and preservation of fruits and vegetables	Private
11	BERNINA d.o.o.	Čapljina	46.2 Wholesale of agriculture row materials and live animals	Private
12	BILI PROMET d.o.o.	Čapljina	46.2 Wholesale of agriculture row materials and live animals	Private
13	CELTIC d.o.o.	Čapljina	46.2 Wholesale of agriculture row materials and live animals	Private
14	Seosko gospodarstvo DUBRAVKA	Čapljina	10.3 Processing and preservation of fruits and vegetables	Private
15	KETA d.o.o.	Ljubuški	46.2 Wholesale of agriculture row materials and live animals	Private-public partnership
16	VETERINARSKA STANICA JP	Čapljina	75. Veterinary service	State-owned
17	Mlini Krešić d.o.o.	Čapljina	10.6 Milling industry and corn production	Private
18	VITA-VI d.o.o.	Čapljina	10.5 Dairy production	Private
19	ZVEČEVO-LASTA d.d.	Čapljina	10.7 Bakery, flour products and cakes	Private
20	VINERA-PRODUKT d.o.o.	Ravno	11.0 Production of beverages	Private
21	ĆUK d.o.o.	Prozor - Rama	46.2 Wholesale of agriculture row materials and live animals	Private
22	ŠUMSKI PLOD d.o.o.	Prozor - Rama	10.3 Processing and preservation of fruits and vegetables	Private
23	ESO-PROMET d.o.o.	Stolac	46.3 Wholesale of food, beverages and tobacco products	Private

No.	Name	Location	Area of work/Business classification, BiH 2010	Ownership type
24	Vinarija EROVINO d.o.o.	Stolac	11.02 Wine production	Private
25	AVDIĆ d.o.o.	City of Mostar	46.3 Wholesale of food, beverages and tobacco products	Private
26	VEXTRA d.o.o.	City of Mostar	10.8 Other food products	Private
27	Hercegovačka pivovara d.o.o	City of Mostar	11.0 Production of beverages	Private
28	K+G+H d.o.o.	City of Mostar	10.4 Production of vegetable and animal oil and fat	Private
29	D.V. VALPOVKA d.o.o.	Grude	10.9 Animal feed production	Private
30	ENIGMA d.o.o.	Grude	46.2 Wholesale of agriculture row materials and live animals	Private
31	MESOPROMET BAJO d.o.o.	Grude	10.1 Meat processing and packing and meat production	Private
32	SABMES d.o.o.	Grude	10.1 Meat processing and packing and meat production	Private
33	ZARKAN-PROMET D.O.O.	Grude	46.3 Wholesale of food, beverages and tobacco products	Private
34	"FARMA TOMISLAVGRAD" d.o.o	Tomislavgrad	01 Plant-growing, cattle breeding, hunting, and associated services	Private
35	TRGOCRVENICE d.o.o.	Tomislavgrad	46.3 Wholesale of food, beverages and tobacco products	Private
36	Punionica sokova MIA	Tomislavgrad	10.3 Processing and preservation of fruits and vegetables	Private
37	ŽITO d.o.o.	Ljubuški	46.2 Wholesale of agriculture row materials and live animals	Private
38	COONAGRA-POLJOPRIVREDA d.o.o.	Ljubuški	46.2 Wholesale of agriculture row materials and live animals	Private
39	DALMI d.o.o.	Ljubuški	46.3 Wholesale of food, beverages and tobacco products	Private
40	DR. SADIKOVIĆ d.o.o.	Ljubuški	10.8 Other food products	Private
41	VETERINARSKA STANICA d.o.o.	Ljubuški	75. Veterinary service	State-owned
42	MEDIX d.o.o.	Ljubuški	01 Plant-growing, cattle breeding, hunting, and associated services	Private
43	ROING d.o.o.	Ljubuški	10.8 Other food products	Private
44	SVITLICA EXPORT IMPORT d.o.o.	Ljubuški	10.3 Processing and preservation of fruits and vegetables	Private

45	VINOGRADI NUIĆ d.o.o.	Ljubuški	11.02 Wine production	Private
46	AD Veterinarska Stanica	Nevesinje	75 Veterinary service	Private-public partnership
47	"Šipovac" d.o.o.	Nevesinje	10.5 Dairy production	Private
48	"Damjancompany" d.o.o.	Nevesinje	75. Veterinary service	Private
No.	Name	Location	Area of work/Business classification, BiH 2010	Ownership type
49	TEKIJA d.o.o.	City of Mostar	10.1 Meat processing and packing and meat production	Private
50	TIHOMIR MIŠIĆ d.o.o.	City of Mostar	10.7 Bakery, flour products and cakes	Private
51	UNIKOMERC d.o.o.	City of Mostar	46.61 Wholesale of agriculture machinery, equipment and tools	Private
52	Arome d.o.o.	City of Mostar	10.8 Other food products	Private
53	POLJO VET MEHANIZACIJA d.o.o.	Konjic	*	Private
54	AGROJATA d.o.o.	Konjic	10.9 Animal feed production	Private
55	FARMA-LAND d.o.o.	Posušje	10.9 Animal feed production	Private
56	ŠARAC HIS d.o.o.	Čitluk	46.3 Wholesale of food, beverages and tobacco products	Private
57	AGROODAK d.o.o.	Čitluk	*	Private
58	EUROGAST-INTERNATIONAL d.o.o.	Čitluk	46.61 Wholesale of agriculture machinery, equipment and tools	Private
59	Monaco d.o.o.	Čitluk	11.02 Wine production	Private
60	PODRUMI ANDRIJA d.o.o.	Čitluk	11.02 Wine production	Private
61	Poljoprivredna zadruga Agropod	Čitluk	11.0 Production of beverages	Private
62	Vinarija Čitluk d.d.	Čitluk	11.02 Wine production	Private
63	VINARIJA STANKELA d.o.o.	Čitluk	11.02 Wine production	Private
64	VINOGRADARSTVO I PODRUMARSTVO ODAK d.o.o.	Čitluk	11.02 Wine production	Private
65	Vitis d.o.o.	Čitluk	11.02 Wine production	Private
66	GRADSKA PEKARA JABLANICA d.o.o.	Jablanica	10.7 Bakery, flour products and cakes	Private
67	ZZ JABLANICA	Jablanica	10.8 Other food products	Private
68	POLJOPREMA d.o.o.	Bileća	46.61 Wholesale of agriculture machinery, equipment and tools	Private
69	Mljekara Pađenid.o.o.	Bileća	10.5 Dairy production	Private

70	"BKV Group" d.o.o.	Bileća	10. Animal feed production	Private
71	MOBIS PHARM d.o.o.	City of Mostar	10.8 Other food products	Private
72	AGROM - EM d.o.o.	City of Mostar	46.2 Wholesale of agriculture row materials and live animals	Private
73	EUROEHO d.o.o.	City of Mostar	46.3 Wholesale of food, beverages and tobacco products	Private
No.	Name	Location	Area of work/Business classification, BiH 2010	Ownership type
74	Mljekara Rakitno d.o.o.	Posušje	10.5 Dairy production	Private
75	VETERINARSKA STANICA D.O.O.	Posušje	75 Veterinary service	Private
76	LIMIT D.O.O.	Posušje	46.3 Wholesale of food, beverages and tobacco products	Private
77	MEGGLE D.O.O.	Posušje	10.5 Dairy production	Private
78	MPT D.O.O.	Posušje	11.0 Production of beverages	Private
79	REMIKO D.O.O.	Posušje	11.0 Production of beverages	Private
80	VETERINARSKA STANICA RAKITNO-VRPOLJE D.O.O.	Posušje	75. Veterinary service	Private
81	A.D. Popovo Polje	Trebinje	*	Private
82	D.O.O. Vukoje	Trebinje	11.02 Wine production	Private
83	Swiss lion d.o.o. Trebinje	Trebinje	10.7 Bakery, flour products and cakes	Private
84	Koka-produkt d.o.o.	Ljubinje	01 Plant-growing, cattle breeding, hunting, and associated services	Private
85	J.P. VETERINARSKA stanica d.o.o.	Široki Brijeg	75. Veterinary service	Private
86	VAMARIG d.o.o.	Široki Brijeg	10.7 Bakery, flour products and cakes	Private
87	ZAVOD ZA POLJOPRIVREDU ZHŽ	Široki Brijeg	*	State-owned
88	"Prodakomerc" d.o.o.	Trebinje	46.3 Wholesale of food, beverages and tobacco products	Private
89	"Herzeg med" d.o.o.	Trebinje	10.8 Other food products	Private
90	"MIX" d.o.o.	Trebinje	10.9 Animal feed production	Private
91	"Podrumi manastira Tvrdoš" d.o.o.	Trebinje	11.02 Wine production	Private
92	"Žalfija" pčelarska zadruga	Trebinje	10.8 Other food products	Private