



Deliverable 1.1. Assessment and analysis report on stakeholders' needs

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Executive summary

Western Balkans countries are facing similar challenges regarding agricultural production and rural development. The latter are mostly related to the modernization of food engineering and food management practices. Organic agriculture production, post-harvest processes, environmental footprints, supply chain management, industrial ecology, are new requirements that need new competences and skills. These competences and skills are quite important in the process of EU approximation and integration and should be addressed by educational programmes offer. Accordingly, to these new needs, the STEP project aims to build the capacity of partner countries HEIs, in order to help them improve the quality of the education offered and provide an education that is more aligned to the needs of the labour market and society.

The MSc programme will offer advanced knowledge to graduates working in particular, in rural, agricultural areas which will contribute to the transition to sustainable food production systems. Sustainable food production systems offer opportunities for economic benefits, creation of jobs, enhanced food safety and security. In this framework the Work Package 1 is the key driver of the project. The overall objective of this work package is to provide the background and support the design of the STEPS programme in order to meet labour market and society's needs and expectations. Thus, the specific objective of the needs assessment process is to address new job market needs induced by new and forthcoming Western Balkan countries (Albania, Kosovo and Bosnia & Herzegovina) public policies on sustainable food systems. To explore partner countries' needs in terms of skilled engineers and managers, which will support every aspect of the transition towards sustainable food production systems.

This report will review and analyse the needs of rural societies, labour market, national organisations and stakeholders at large in terms of the highly educated and skilled engineers and managers needed to improve food production, transform traditional harvest and post-harvest practices, manage processes and systems, monitor food quality and safety and also, exploit opportunities to innovate, increase productivity and competitiveness of food production systems. Several research instruments have been employed in order to identify the competencies and skills needed by the future STEP MSc in Sustainable Food Production Systems, such as in-depth interviews, online surveys and focus groups. All the previously mentioned instruments, have been undertaken with several stakeholders dealing with food policy, academia, business sector, national and local administration dealing with food systems etc. Firstly, about 40 in depth interviews have been undertaken, (17 in Albania, 15 in Bosnia & Herzegovina and 8 in Kosovo).

The purpose of in depth interviews and focus groups, is to collect stakeholder perceptions on a) sustainable food systems, b) the dynamic of food production systems, c) the perceived changes in the last years, d) its comparison with the EU and regional level and the general context of its development taking into consideration social and environmental issues, e) challenges that the workforce is facing, and f) the needed skills to better perform their activities. Secondly, about 200 online surveys have been completed (respectively 70 in Albania, 71 in Bosnia Herzegovina and 60 questionnaires in Kosovo). Through the online questionnaire perceptions on sustainability are collected. In addition to that, 39 skills and competences are evaluated regarding the level of importance and the level of proficiency required.

Thirdly, in order to have more accurate evaluation of the needs in the respective countries and to identify the competencies and skills within food systems in Albania, Bosnia & Herzegovina and Kosovo 31 focus groups/study visits were performed, (respectively 10 focus groups or/and study in Albania, Bosnia & Herzegovina, and 11 study visits in Kosovo).

The results show that the respondents in both countries do not have a clear view on what sustainability on food systems is. A high percentage of companies claim that they need further qualification and training for their employees in food technology, sustainable supply chain, food legislation, raw material and nutrition, nutrition science, entrepreneurship and development sustainable food production systems.

The analysis of the focus groups shows also that the future professional needs further trainings on:

- Knowledge of a sustainable food production chain, from proper production, processing and distribution to the final consumer.
- Knowledge in waste management and food system impact to environment.
- Adoption of sustainable natural resource use in day-to-day economic practice.
- High level of IT knowledge and competencies.
- Capability to apply a holistic approach to work, not only rigidly adhere to the learned rules, as food production is very dynamic, and changes are fast and visible.
- Leadership skills are required, to be able and capable of taking responsibility and decision making.
- Knowledge in the food safety segment and the implementation of food safety and quality standards. More practical experience in this segment, as well as the product marketing segment are required.
- Knowledge in economics issues: marketing, management, capability of planning and analysing, as well as competences in project cycle management.

The interviewed companies do not have a satisfying level of cooperation with academia, and they value study visits with the intention of learning about different practices, internship that lasts longer than 3 months, students conducting research for the company, experimental learning, recruitment, and promotion as possible collaboration modes with academia in the future. Therefore these modalities should be taken into account during the design of the master program.

1.Introduction

Sustainable food systems in practice: From farm to fork

Sustainable food production is “a method of production using processes and systems that are non-polluting, conserve non-renewable energy and natural resources, are economically efficient, are safe for workers, communities and consumers, and do not compromise the needs of future generations (Foresight 2011).

Food systems can be defined as the processes involved in the provisioning of food, fiber, and fuel products. These processes include growing, harvesting, processing, preparing, packaging, transporting, marketing, consumption, and managing waste. Food systems also include associated inputs to and outputs from these processes and the relationships between actors, institutions, and agroecosystems, as expressed in food system governance, organization, management, movements and ownership (Hilimire., et al 2014). Food systems influence and are influenced by social, political, economic, cultural, and ecological domains, with each component relying on human labour and knowledge (Archer et al. 2008; Ericksen2008).

According to Matson et al. (1997), concerns about water quality and availability, environmental contamination, hunger and nutrition, food safety and security, soil loss, labour conditions, animal welfare, and the causes of climate change have put agriculture and food systems in the spotlight. From this perspective, food systems that do not obstruct the environment and the social aspects of humankind have transformed this issue as very important in the actual and upcoming political agenda. Consequently, the need to understand the food systems as objects of social and environmental governance is increasing. The multidisciplinary topic show that there is also an increasing interest in education system that need to fulfil these new emerging needs.

The concepts of sustainability of food systems is currently discussed for several reasons in the consortium of the STEP project. In the case of Albania: 1)the need to be in compliance with the Acquis Communautaire regarding environmental, agriculture, rural development, social and economic aspects of food systems, 2)the new emerging trends of Albanian consumer perceptions related to organic food (Kokthi et al, 2015,2017) and food safety issues (Kokthi et al, 2016) Guri et al 2019) the need for more innovation and entrepreneurship skills in food systems ,4) the lack of trust in institutions dealing with the food systems, rises the need to have a broader analysis of the food systems and sustainability and increases the need for new curricula in this direction. The existing curricula of the main higher education institutions in Albania that offer skills and interdisciplinary competences in these directions do not have a special focus on sustainability and in the complexity of current food systems. The analysis of the current existing study programmes in Albania shows that lack the multidisciplinary approach in study programmes related to food sector. The same is true in the case of Kosovo as well, where out of 5 reviewed study programs, only three of them have included interdisciplinary courses in their curricula.

In this framework **the Erasmus+ Project: MSc in Sustainable Food Production Systems / STEPS** aim is to implement a modern MSc programme on “Sustainable food production systems” in compliance with the Bologna convention.

- The overall objective of the project is to provide the background and support the design of the STEPS programme in order to meet labour market and society's needs and expectations.
- One of the specific objectives of the STEP project is to explore partner countries' needs in terms of skilled engineers and managers, which will support every aspect of the transition towards sustainable food production systems.

Thus an important aspect of this capacity building process is the need assessment analysis of the main stakeholders dealing with food systems within the STEP project consortium. The present report will give a clear panorama of the existing needs in food sector in Albania, Bosnia Herzegovina and Kosovo.

The report is structured as it follows: The first section provides the context of the food sector within all the countries where the STEPS Master of Science will be implemented. The second section offers the methodology and the research instruments employed in the process of need assessment. The analysis and the discussion of field research's results are presented in the third section. Conclusions of the need assessment study and provision of recommendations for the design of the modules are unfolded in the final section of this report.

2.The context of food sector in each country

2.1. Development in Agriculture and food sector in Albania

Agriculture, fishery and food sector remains one of the top contributors in the Gross Domestic Product (GDP) of Albania, according to INSTAT it contributes to 18.4% of GDP in 2018. Agriculture is characterised by a stabilised but less important growth rates compared with the other economic sectors. During the period 2015-2018, the annual average growth rate for agriculture was 4%, i.e. two times lower compared with the construction sector (INSTAT, 2014). According to the first figures of the new agricultural census organised in the country during 2012, released by the Albanian Institute of Statistics (INSTAT), Albania has about 325 thousand active farms (EC, 2013). In the last ten years the average farm size has increased by 15%, from 1.04 ha/farm in 2002 to 1.20 ha/farm in 2018 (INSTAT, 2018), but it remains extremely small. The average plot size in 2017 is only 0.26 ha. The limited farm surfaces and the important level of fragmentation make the use of large-scale agricultural infrastructure difficult, especially in hilly and mountain areas. The hilly and mountain areas cover respectively 37% and 19% of country's territory (INSTAT, 2018). Land insecurity, due to the delay of compensation of the former landowners and lack of appropriate policy instruments discourage farmers to increase the farming surface (MARD, 2018). Albanian agriculture suffers from critical structural problems such as: i) underdeveloped irrigation and drainage systems, ii) deficient infrastructure, iii) limited access to markets, iv) low technological level, v) weakness of farmers' organisations, and vi) limited access to credit vii) underdeveloped agro-food industry, (MARD, 2018). Nevertheless, the agro-food industry is an important sector of the economy. It has an importance in the country's agricultural production, with a specific weight to the agricultural sector by 21.7%. The sector reflects a positive trend year-on-year, with an increase value of 5 % in 2017 compared to 2016. In the table below are shown the main figures related to this sector.

Table 1: Food industry in numbers from 2011-2017

Designation	Year						
	2011	2012	2013	2014	2015	2016	2017
Number enterprises	2,273	2,315	2,336	2,298	2,354	2,428	2,541

Number of employees	11,282	11,407	11,769	11,719	12,659	13,084	13,920
The value of production (000/€)	402,793	442,886	440,460	452,733	459,480	489,582	514,544
Total investments (000/€)	5,709	8,814	9,197	9,852	9,998	10,424	10,635

Source: Ministry of Agriculture and Rural Development, 2017

The number of enterprises for 2017 is 2,541; with an increase of 5% compared with 2016. The largest number of enterprises is presented by bread production enterprises (56%); vegetable oil production (8%); milk and processed products (13%) etc. About 28% of the enterprises are mainly concentrated in Tirana; 12%; Fieri and 9% in Vlora.

Table 2: Number of establishments according to subsectors

No	Activity	2016	2017
1	Meat offal	34	33
2	Meat products	82	121
3	Canned fish	8	12
4	Preparation of fruit and vegetable cans	20	21
5	Production of vegetables oils	193	193
6	Milk and milk products	328	332
7	The fabrication of flour from cereals	119	120
8	Bread production	1,411	1,424
9	Biscuit production	16	18
10	Production chocolate and sweets	11	11
11	Spices and Sauces	11	8
12	Distilled alcoholic beverages production	28	33
13	Wine production from grape	67	69
14	Beer production	10	13
15	Water and soft drinks production	34	27
16	Others	56	22
	Total	2,428	2,541

Source: MARD, 2018

The increasing number of the employees in the food sector and the need for new skills and competences show the pertinence of the STEP project. The number of employees in 2017 is about 13,920, with an increase of 6.4% compared to 2016. This increase is important in bread production sector by (16%) followed by pasta production sector (9%) and alcoholic beverage production (7%). The highest number of employees is concentrated in Tirana (36% followed by Durres with 12% and Fieri with 11%.

According to the reports of Ministry of Agriculture and Rural Development, MARD (2017¹) the value of production is increased, mainly in milk and dairy products sectors; canned fish sector; water and soft drinks sector. On the other hand, there is a decline in the production of sweets.

However according to MARD, (2018) the development of food processing sector in Albania is constrained by a number of factors, some of which relate to scarcity of raw materials, insufficient homogeneity of quantities and quality, weak vertical integration between the producers of raw materials and the processing industry, lack of resources to improve food quality by introducing quality and food safety assurance systems.

The establishment of food safety and food quality systems is applied with efficiency in larger food processing companies. Investments to comply with standards for environmental protection and treatment of waste are extremely limited. In the following tables are summarized the main constraints dealing with meat, milk, fruits and vegetables sectors in Albania.

Similar to the agriculture sector in general, the growth of the food processing sector is constrained by the limited internal resources of the entrepreneurs and difficult access to credit. In the following tables are listed the main problems related to the main sectors respectively to the production unit and processing sectors.

Table 3: Meat and meat processing sector

Sector constraints
<ul style="list-style-type: none"> • Problems with pasture management in terms of vegetation, biodiversity, overgrazing, etc. • Small-scaled farm structure and prevailing subsistence farming; • Inadequate physical capital (premises/facilities), low level of mechanisation at farm level and limited application of modern technologies, storage and management of manure; • Low yields in fodder production/lack of mechanisation; • Cattle breeds not suitable for meat production/low productivity of breeds; • Ageing farm population and lack of interest and motivation of youth to consider farming as a main occupation; • Insufficient knowledge, information and skills on modern farm management, national and EU standards; weak compliance with standards; • Weak enforcement of food safety and environmental legislation; • Difficult access to credit/high cost of credit; • Limited vocational training capacity and insufficient range and quality of specialised advisory services; • Public rural infrastructure underdeveloped.
Meat processing
<ul style="list-style-type: none"> • Unreliable and unstable quality of local supplies, insufficient quantity and high cost of supplies; • Strong informal sector in slaughtering, lack of enforcement and compliance with standards on

¹ The last data registered from this institution

- slaughtering (hygiene, animal welfare and waste treatment/poor management of municipal slaughter houses); outdated technologies and production facilities;
- Lack of rendering capacities;
 - Missing or weak food safety management systems, equipment, laboratories, and as well as knowledge and skills of the labour force and management;
 - Poor waste disposal and treatment practices/facilities and technologies and low by-product utilisation.

Source: *Intersectoral Strategy of Agriculture and Rural Development 2016-2020*

Table 4: Milk and milk processing sector

Sector Constraints
<ul style="list-style-type: none"> • Poor maintenance of pasture and meadows; • Small-scaled farm structure and prevailing subsistence farming; • Poor hygiene of milk/weak incentives to produce high quality milk; • Inadequate physical capital (cooling, milking equipment, facilities and mechanisation); • Low yields in fodder production/lack of mechanisation/insufficient storage of fodder; • Low productivity of breeds; • Inadequate animal health management /Prevalence of some animal diseases; • Inadequate manure handling practices; • Weak links among actors in the value chain, especially between farmers and processors (milk collection systems); • Insufficient knowledge, information and skills on national and EU standards; weak compliance with the standards; • High informality of the sector; • Public rural infrastructure underdeveloped.
Milk processing constraints
<ul style="list-style-type: none"> • Insufficient and unstable quantity and quality of milk supply; • Milk collection – small scale farming, lack of adequate facilities, specialised vehicles and laboratory equipment to control and preserve milk quality; • Processing - inadequate technologies and equipment (especially cheese production); lack of qualified labour (milk processing technology, laboratory, etc.) in rural areas; • Missing or weak food safety management systems, equipment, laboratories, and as well as knowledge and skills of the labour force and management; • Lack of adequate facilities and practices for treatment and utilisation of waste; • Poor public infrastructure in rural areas (roads, electricity supply).

Source: *Intersectoral Strategy of Agriculture and Rural Development 2016-2020*

Table 5: Fruit and vegetables production and processing

Sector Constraints
<ul style="list-style-type: none"> • Small-scale production; • Underdeveloped co-operation between farmers (post-harvest facilities, machinery ring, water management schemes). • Weak links / coordination between producers and processors to scale up production;

- Lack of specialised farm mechanisation and harvesting equipment;
- Underdeveloped post-harvest practices/lack of equipment and storage facilities;
- Lack or out-dated irrigation systems;
- Lack of producers' knowledge of quality requirements and specifications of raw vegetables for food industry /Production does not comply with global GAP/ no body accredited to certify farms at reasonable costs;
- Inadequate controls on level of pesticides and residues.

Fruit and vegetables processing

- Low /unstable quality of the raw material for processing;
- Lack of specialisation in processing industry;
- Lack of sufficient capacity of cold storage facilities;
- Outdated Technologies;
- Poor food safety standards – inadequate facilities, lack of equipment for food safety and quality control;
- No treatment of residual waste;
- High informality and unfair competition from operation of unlicensed enterprises.

Source: *Intersectoral Strategy of Agriculture and Rural Development 2016-2020*

Table 6: Grape cultivation and wine processing

Sector constraints

- Unsuitable cultivars for wine production;
- Limited knowledge on modern grape cultivation technologies;
- Lack of specialisation in table grape production;
- Low specialised farm mechanisation;
- Small-scale production;
- Lack of harvest and post-harvest infrastructure - grading and storage;
- Insufficient cold storage infrastructure;
- High prices and low quality of inputs/ inefficient farming practices;
- Water management - public irrigation and drainage system is dysfunctional, lack of efficient on farm irrigation technologies.

Wine processing

- Low quality and insufficient quantity of wine grape;
- Insufficient use of autochthon grape varieties for the development of quality schemes;
- Weak links /coordination between growers and processors;
- High share of informal production leading to unfair competition, poor safety and low quality standards;
- Lack of specialisation and underdeveloped quality wines production;
- Outdate technologies and equipment, such as storage tanks and fermenters;
- Poor safety standards (HACCP and water waste);
- Poor internal/integrated laboratory infrastructure;
- Poor technological expertise in informal and small wineries;
- Lack of knowledge of brands and trademarks and their protection;
- Poor marketing - unfavourable price/quality ratio of quality wines;

-
- Limited promotion of domestic high-quality wine by wine producers or their associations.

Source: *Intersectoral Strategy of Agriculture and Rural Development 2016-2020*

Table 7: Environment and land management

Main constraints
<ul style="list-style-type: none"> • Continuing biodiversity loss; • Uncontrolled and inefficient use of natural resources, including overexploitation; • Degradation of agricultural land and soil erosion in some parts of the country due to inadequate farming techniques, non-application of crop rotation, low and unbalanced use of organic and mineral fertilizers, ineffective measures for plant protection; • Pollution caused by poor waste management systems; • Deforestation; • Low environmental and climate change awareness of farmers; • Lack of knowledge and skills on sustainable agriculture practices; • Weak enforcement of legislation.

Source: *Intersectoral Strategy of Agriculture and Rural Development 2016-2020*

In the constraint analysis among the other problems is highlighted the issue of competences and the lack of skills and knowledges in all the above-mentioned sectors. However, the desk research shows that these sectors represent several strengths and opportunities that should be emphasised such as:

- The positive dynamic and the consolidation of the processing industry
- Improved capacity of the industry associations and private consultants to advise on GMP/HACCP systems.
- The alignment of the legal framework on food safety with EU standards.
- Increasing domestic demand and consumer preferences for traditional locally produced products on domestic market.
- Increasing consumer awareness on the food quality and safety issue.
- Improving access to EU markets.
- Emerging experience in modern production techniques.

- Increasing investments (mainly of larger companies) in food safety/quality - facilities and equipment.
- Strengthened government policy to improve hygiene standards and consumer protection.
- Rich biological and landscape diversity.
- Rich and big variety of water resources.
- Diverse resources for renewable energy.
- EU support for alignment of legislation, policy and actions.
- Increased awareness related to healthy food and environment protection.
- Increasing consumer awareness on the food quality and safety issue.
- Increased demand on alternative tourism – rural, “green” tourism, etc.

As previously mentioned from the desk research process in almost all the considered sectors of the food industry in Albania, it is stressed the lack of skills and competences of the human resources employed in the meat sector, milk, fruit and vegetables, and environment management. However, it is important to

understand what are the main skills and competences that are actually lacking in those sectors. The examination of the needed skills from the perceptions of the stakeholders dealing directly or indirectly, at the local and national level within the food systems will be developed in the following section.

2.2. Development in Agriculture and food sector Bosnia and Herzegovina

Agriculture and the food industry are important economic sectors of the economy of Bosnia and Herzegovina, its entities and the Brcko District², both in terms of participation in the creation of gross value added (GVA) and total employment of the population, as well as in shaping and stabilizing further socio-economic development. Their economic vitality, ability to grow and improve export performance in times of crisis and contraction of economic growth, make them the basic "stabilizer" of BiH society and economy. Increasing poverty is a problem that further complicates the social situation, especially in the rural areas of both BiH entities. The sector enables the generation of income for the local population and stops negative social processes (migration, aging of the village population, etc.), and enables the preservation and protection of cultural, historical and natural heritage. However, for the time being, the agriculture sector has failed to effectively mobilize available natural resources, nor is it in a position to use them rationally.

In 2016³, sector A (agriculture, forestry and fisheries) accounted for 6.4% of GDP (gross domestic product) with EUR 975 million GVA, while the food industry accounted for 2.5% GDP of total food industry with EUR 385 million GVA. Compared to 2007, in 2016 GVA from sector A increased by 88 million Euros or 9.8 index points, while growth in GVA from the food industry was significantly more pronounced and increased by 76 million Euros or 24.6 index points. The importance of agriculture and food processing sectors is also reflected in significant participation in employment. In 2017, according to the Labour Force Survey, there were 154 thousand people employed in Sector A, which made up 18.9 of total employment in BiH. One of the most significant features of BiH's agri-food sector is its negative trade balance, with around € 1 billion a year throughout the period of 2008-2017. Analysing the overall trends of BiH imports, exports and trade balances of agri-food products in the period 2008-2017, there are some positive characteristics evident. Total exports of agri-food products increased more than twice ten years later from 217 million Euros in 2008 to reach 541 million Euros in 2017.

At the same time, however, there was an increase in the total imports of these products, but the tendency of increase was lower in percentage than it was in exports. In 2008, imports of agri-food products amounted to 1.3 billion Euros and in 2017 increased to 1.6 billion Euros. The level of 1.4 - 1.6 billion Euros of total imports has been maintained for the last five years. Finally, the movement in the coverage of imports by exports also confirms the positive developments in the foreign trade balance of agri-food products. This rate doubled from 16.5% in 2008 to 33.6% in 2017.

² Bosnia and Herzegovina is characterized by a complex state structure as a result of the General Framework Agreement for Peace in BiH, signed in late 1995 in Dayton (USA). According to this agreement, BiH is a state with two entities (Federation BiH - FBiH and Republika Srpska - RS) and Brcko District of BiH (BD BiH), asymmetrically constituted (10 cantons make up FBiH) with different levels of government. In the FBiH, there are four vertical levels of government (municipality, city, canton and Federation), and in the RS only two (municipality and entity level).

³Source: Agency for Statistics of Bosnia and Herzegovina (2018): Gross Domestic Product by Production, Income and Expenditure Approach 2016, Thematic Bulletin TO 01, Sarajevo

According to statistics for 2017, in the structure of agricultural land of a total of 2.28 million ha, arable land occupies 1.06 million ha, permanent orchards and vineyards 104 thousand ha, and grassland - natural meadows and pastures 1.07 million ha. One of the bigger problems that is present in BiH is the extremely high share of unused land, almost half (48%, 2017) of the highest quality arable land. With 301 ha of arable land and 645 ha of agricultural land per 1,000 inhabitants, Bosnia and Herzegovina is in relatively good condition when it comes to critical boundaries of the land needed to produce sufficient food for the population to survive. The sowing structure on the arable land used has not changed for many years, with cereals having the largest share in the sown area of as much as 58%, followed by fodder with 26%, vegetables with 14% and industrial plants with less than 23%. In the value of total agricultural production in 2017, crop production with EUR 610 million contributes with 48%, and livestock production with EUR 647 million with 52%.

According to the data obtained from the Census (2013), the total number of households engaged in agricultural activity in BiH is 363 thousand, of which 16% and 57 thousand are market oriented. The total number of registered holdings eligible for budget incentives in 2016 in BiH was 100,693, of which: 64,534 households in the Federation of BiH, 34,965 households in the Republika Srpska and 3,194 households in the Brcko District of BiH (MoFTER BiH, 2017). Despite the lack of official statistics on the number, size and structure of agricultural holdings in BiH, it is certain that the problem of farm size, fragmented land ownership and dual structure of these production units is still present. BiH continues to be dominated by small farms, and there is a marked fragmentation of land parcels, to which we can add the current post-war problem of minefields, which further complicate the situation and lead to partial or complete abandonment of production and housing in certain areas of the country. One of the major problems of primary agricultural production in BiH is its low productivity, expressed in yield per unit of production measure. Inefficient and limited production on small holdings, extensive production feature, low level of farm equipment and insufficient technical and technological knowledge of farmers are just some of the factors that place BiH at the bottom of the European scale when it comes to the size of average yields of most agricultural production.

The food industry in BiH has recorded significant positive growth each year, and in the last ten years (2007-2016) GVA of this sector has increased by 25%. Notwithstanding this fact, this sector is still in a development phase in which many aspects of business efficiency but also market orientation and customer orientation must be improved. The BiH food industry has a very traditional range of products. Very little is being invested in innovating the range and adapting to the demands of an increasingly sophisticated market. The appearance of the product, the size of the packaging, as well as the communication on the market are not adapted to the needs of the modern customer and are significantly worse in comparison to regional leaders. Companies pay little attention to aspects of the product that save the customer time, make it easier to use and store the product. This is one of the most significant reasons for the low competitiveness of the BiH food industry.

The value chain of the food industry is inefficient, i.e. vertical and horizontal coordination (cooperation) are at a very low level and therefore companies cannot "enjoy" the benefits of external economies of scale (easy availability of market information, joint appearance in foreign markets, technology transfer etc.). Horizontal coordination at the food industry level is almost non-existent. Companies are not ready to forward, exchange or appreciate even their business and capacity information. That is why BiH companies operate in a limited segment of the domestic market, compete with each other, while very attractive segments of the domestic market are almost left to foreign producers. The competitiveness of the food industry is also

affected by the underdevelopment of complementary industries. So many company inputs and materials must be imported. This further complicates business, especially for micro and small food companies. The link between the food industry, wholesale and retail is almost non-existent. Large supermarkets often charge companies "entry" into the supermarket, are late in payment, dictating prices, thus reducing the ability of food companies to make a significant return on their investment. This reduces the capacity of the industry to invest and innovate, and to improve the efficiency of its own production and distribution.

According to the report of MoFTER (2016), when it comes to business efficiency, the assessment is that companies need to be more proactive in building and shaping efficient value chains and all other forms of business interest, interconnection and sharing of information and resources, and start actively working on efficient knowledge and technology transfer. In 2016, there were a total of 767 companies and 1,825 entrepreneurs from the food processing sector in BiH, employing 28,374 persons, accounting for 5.5% of official employment⁴. Viewed across BiH entities, according to the available data in the FBiH, one of the major problems of the food industry is still the underutilization of installed capacity. The best utilization of installed capacity is in the processing of fruits and vegetables (62%), milk processing (56%) and the production of soft drinks (54%), while the very low utilization in the production of mineral waters (16%), wine (16%) and in the manufacture of biscuits and waffles (19%). An overview of installed capacities and realized production in the food industry in FBiH in 2015 can be seen in the following table review.

Table 8: Installed and utilized capacities of the food industry in the Federation of BiH (2015)⁵

	Food industry branch	Unit	Installed capacities	Achieved production	% utilization
1.	Mill industry	t	397.500	146.215	37%
2.	Milk production	000 lit.	332.000	185.956	56%
3.	Meat processing industry	t	169.000	56.288	33%
4.	Fruit and vegetables processing	t	16.400	10.170	62%
5.	Biscuits and waffles production	t	28.100	5.452	19%
6.	Beer production	hl	1.500.000	406.354	27%
7.	Mineral water production	000 lit.	420.000	66.315	16%
8.	Soft drink production	000 lit.	360.600	194.464	54%
9.	Wine production	000 lit.	26.400	4.114	16%
10.	Cigarettes manufacturing	t	7.000	2.289	33%

Source: Bosnia and Herzegovina's 2015 MoFTER Annual Report on Agriculture, Nutrition and Rural Development

In the case of another BiH entity, the Republika Srpska, in the food industry in recent years, a process of consolidation has been expressed (e.g. in the dairy industry) while opening a number of small plants (e.g. fruit and vegetable processing, wine production). Regardless of the fact that the situation in the RS food industry is not satisfactory, it represents 16.5% in the value of sales of the Republika Srpska industry sector (an additional 1.4% production of beverages and 0.4% production of tobacco products). At the end of 2015,

⁴ Bosnia and Herzegovina Annual Report 2015 on Agriculture, Nutrition and Rural Development, Ministry of Foreign Trade and Economic Relations, 2016, p. 28.

⁵ Bosnia and Herzegovina Annual Report 2015 on Agriculture, Nutrition and Rural Development, Ministry of Foreign Trade and Economic Relations, 2016, p. 28.

the number of active economic operators in the food sector in the RS was 309 and tends to increase slightly. Also, the overall business result of this sector is positive. Growth rates of the food industry were 121% in 2015, 115% in 2014 and 108% in 2014. At the same time, employment grew more slowly, indicating that productivity in the food industry is increasing⁶.

Table 9: Number and level of utilization of food industry capacities in Republika Srpska (2015)⁷

	<i>Food industry branch</i>	<i>Drive unit</i>	<i>% utilization</i>
1.	Meat and meat products industry	20	40%
2.	Fruits and vegetables production	15	40%
3.	Milk and milk products industry	14	60%
4.	Mill products industry	30	30%
5.	Confectionery products industry	4	30%
6.	Production of tea, spices, and similar products	3	40%
7.	Sugar production	2	12%
8.	Beer production	1	40%
9.	Water production and filling	2	50%
10.	Tobacco industry	1	10%

Source: Bosnia and Herzegovina's 2015 Annual Report on Agriculture, Nutrition and Rural Development.

In general, the food industry in BiH can be said to be rather unfavourable, as micro and small enterprises dominate the total number of enterprises. This industry operates with a very low-capacity utilization and is less market-oriented and more product-oriented. The under-empowered food industry is incapable of taking on the role of a major vertical linking actor in an efficient value chain. Sector development is also hampered by underdeveloped logistics, that is, businesses that facilitate the marketing, storage, refinement and marketing of products, and enable more efficient exchange of information between end customers and various sector actors. The sector also lacks services that provide "smart services" such as designing market appearances, providing information on market needs, programs for technological, marketing and managerial business improvement, benchmarking, and the like. These are just some of the weaknesses and limitations of the agriculture and food sectors. The following tables list the main problems related to the main subsectors respectively to the production unit and food processing sectors.

⁶ Industry, Bulletin no. 1, RS Statistical Office, 2017.

⁷ Bosnia and Herzegovina Annual Report 2015 on Agriculture, Nutrition and Rural Development, Ministry of Foreign Trade and Economic Relations, 2016, p. 28

Table 10: Meat and meat processing sector

Sector constraints
<ul style="list-style-type: none"> ● Small holdings with a small number of cattle and non-specialized production; ● Low average yields in animal feed production ● Poor technical and technological equipment of the farm; ● Poor breed composition (lack of meat breeds); ● Few commercial farms (mostly self-cultivation); ● Low level of technical and technological knowledge of manufacturers; ● Poorly developed meat industry ● Uncertain placement for fattening producers - Raw materials import industry ● Poor connection between producers and processors; ● Poor producer organization (lack of associations / cooperatives). ● Undeveloped agricultural counselling ● Lack of favourable loans (lack of rural financing)
Meat processing
<ul style="list-style-type: none"> ● Underutilization of installed capacity ● High dependence on raw material imports ● Poor vertical and horizontal connection ● Traditional product range and insufficient research on customer needs ● Insufficient adherence to hygiene and other food safety standards in the context of the EU market ● Traceability of production is not met in accordance with the requirements of market standards ● Practices Poor disposal practices / facilities and technologies and low utilization of by-products.

Source: Own research

Table 11: Milk and milk processing sector

Sector Constraints
<ul style="list-style-type: none"> ● Adverse farm structure and pronounced dualism in the production of this sub-sector, ● Unfavorable breed composition - dominated by Simmental breed with meat and milk characteristics, while Holstein-Friesian breed as exclusively dairy breed significantly lags behind; ● Insufficient education of farmers and in this context, lack of knowledge of modern hygiene standards in milk production and inability to produce sufficient quantities of fodder on their own plots; ● Low feed conversion rate; ● Low average yield per cow; ● High quality control costs; ● Issues related to the adoption of (EU) standards that have direct implications for exports to EU countries; ● Low technical and technological level of average farms consisting of unconditioned barns, milking rooms, storage and handling of milk ● Poorly developed agricultural advisory service.

<ul style="list-style-type: none"> ● Low average yields in animal feed production
<i>Milk processing constraints</i>
<ul style="list-style-type: none"> ● Lack of scale economies due to the unfavourable structure of the sector; ● Poor financial liquidity due to difficult collection of trade receivables, which seriously threatens the business reproduction of dairies, ● The economic position of milk producers is unstable and unfavourable due to market distortions, increase in raw materials prices and irregular payments of systemic incentives (delay and more than one year) as well as milk from numerous dairies. ● The raw milk market is quite unregulated. ● Low-capacity utilization ● Unfavourable milk processing structure with low content of durable products such as cheeses or lack of more processing phase; ● Low ability to innovate and follow market trends; ● Unavailability of funds on favourable terms; ● very limited marketing and promotional activities; ● High costs and complicated administrative procedures to meet legal requirements. ● Lack of appropriate facilities and practices for waste treatment and use; ● Poor public infrastructure in rural areas (roads, electricity supply).

Source: Own research

Table 12: Fruit and vegetables production and processing

<i>Sector Constraints</i>
<ul style="list-style-type: none"> ● Small and non-specialized holdings with low production volume; ● Poor technical and technological equipment of a large number of households; ● A small number of 2-5 ha farms as the main drivers of fruit production development; ● Extensive production with low and variable yields; ● Lack of irrigation systems; ● Low level of producer knowledge; ● Uneven product quality; ● Lack of education in the field of fruit and vegetable production - poorly developed agricultural professional service; ● Lack of young and educated workforce; ● Uncertain product placement; ● Manufacturers are neither affiliated nor sufficiently aware of the need for association; ● Lack of storage and processing facilities; ● Undeveloped fruit and vegetable processing industry. ● Inadequate controls at the level of pesticides and residues.
<i>Fruit and vegetables processing</i>
<ul style="list-style-type: none"> ● Insufficient and unevenly distributed cooling capacities (mainly for storing fruits and vegetables for consumption, and much less for storing raw materials and semi-finished products) ● Insufficient utilization of installed capacity ● Inadequate quantity and quality of raw materials due to the use of non-certified planting material, low purchase prices, unproven production; ● Inadequate treatment with post-harvest raw materials (transport and storage) causing the highest losses of fruits and vegetables as a result of biological and / or microbial agents and /

- or as a result of mechanical damage
- Outdated processing plants
 - Lack of lines for preparation of fruits and vegetables for processing
 - Shortage of value-added products
 - Complex rules and organizational settings of an inadequate business environment
 - Uneven interpretation of laws and regulations by state, entity, cantonal and municipal services.
 - No treatment of residual waste;
 - Insufficient compliance with market standards

Source: Own research

Table 13: Grape cultivation and wine processing

Sector constraints
<ul style="list-style-type: none"> ● Small-scale production; ● Lack of irrigation systems ● Low share of table wine in total grapes produced (wine varieties dominate) ● Lack of young workforce (strong migration from vineyards) ● Lack of favourable lending conditions for the raising of new vineyards
Wine processing
<ul style="list-style-type: none"> ● Lack of state regulation for grape and wine production ● A PDO / PGI wine protection system has not been established ● Uncontrolled import of raw materials (grapes) from the surrounding countries ● Low culture in wine consumption ● Important share of informal production leading to unfair competition, poor safety and low-quality standards; ● Weak promotion nationally and internationally

Source: Own research

Table 14: Environment and land management

Main constraints
<ul style="list-style-type: none"> ● Insufficient use of natural resources (aspect of agriculture, tourism, entrepreneurship) ● Inefficiency of land, forest and water resources management systems; ● Frequent damage to crops and plantings resulting from natural disasters (drought, floods, hail, frost); ● Unsettled land registry and cadastral status; ● Insufficient awareness of the need for environmental protection and biodiversity conservation; ● Expressed problems of waste disposal; ● minefields; ● Absence of LPIS (Land Parcel Information System); ● Continuing biodiversity loss; ● Uncontrolled and inefficient use of natural resources, including overexploitation; ● Degradation of agricultural land (conversion of agricultural land into construction land) ● Pollution caused by poor waste management systems; ● Deforestation; ● Low environmental and climate change awareness of farmers; ● Lack of knowledge and skills on sustainable agriculture practices; ● Weak enforcement of legislation.

Source: Own research

In the analysis of the limitations of the agri-food sector in BiH, one of the most important problems is the issue of competencies and lack of skills and knowledge. Notwithstanding the aforementioned limitations and problems encountered by the sector, some positive developments and strengths of the sector should be singled out.

They are reflected in the following:

- Positive dynamics and increase in the number of businesses and entrepreneurs in the food industry
- Gradual alignment of the legal framework in the field of food safety with EU legislation
- Introduce more important standards like HACCP in most major food companies
- Raising awareness of the importance of agri-food products produced in BiH
- Increase in domestic sales of traditional and local agri-food products
- Raising consumer awareness of the importance of quality and food safety
- Access to the EU market (significant shifts in the last five years in exporting products of animal origin such as meat and dairy products)
- Increases in investments (mainly of larger companies) in facilities and equipment in the context of increasing the safety and health of manufactured agri-food products
- Raising awareness of the importance of environmental issues
- Unused natural resources
- Existence of resources for renewable energy sources
- Institutional strengthening and EU integration processes
- Increased interest in all forms of rural tourism
- Strengthening the sector's link with academia

The results of the survey (in-depth interviews, round tables and on-line questionnaire) and interviews with respondents from all areas of the food industry showed that Bosnia and Herzegovina lacked the skills and competencies of human resources employed in the sector and its sub-sectors, including environmental management. Examination of required skills from the perceptions of participants who act directly or indirectly at national and local level within food production systems in Bosnia and Herzegovina is given in this report.

2.3. Development in Agriculture and food sector in Kosovo

Agriculture and food production have traditionally played an important role in economic development of Kosovo, and are considered to have a great potential to contribute to the economic development of the country, mainly due to the fact that in Kosovo, 38% of the land is arable and its income from agriculture was approximately 7% of national GDP in 2018, while around 62% (Kosovo Agency of Statistics)⁸ of the population lived in rural areas. Even Though agriculture has historically contributed at a considerable part to the GDP of Kosovo, recently its contribution is declining. Data from Kosovo Agency of Statistics show that the income from Agriculture, forestry and fishing has declined to 7% of GDP in 2018 from 10% in 2016. While the share of agricultural products export value to total export value in 2016 was 15% (Ministry of Agriculture of Kosovo 2017). Annual value of agricultural production in Kosovo through the years 2015-2018 are presented

⁸ Kosovo Agency of Statistics, National Census 2011, page 11

in the table below, from where we can see that the total production in 2018 was 691.43 mil, or 3% lower than that of 2017.

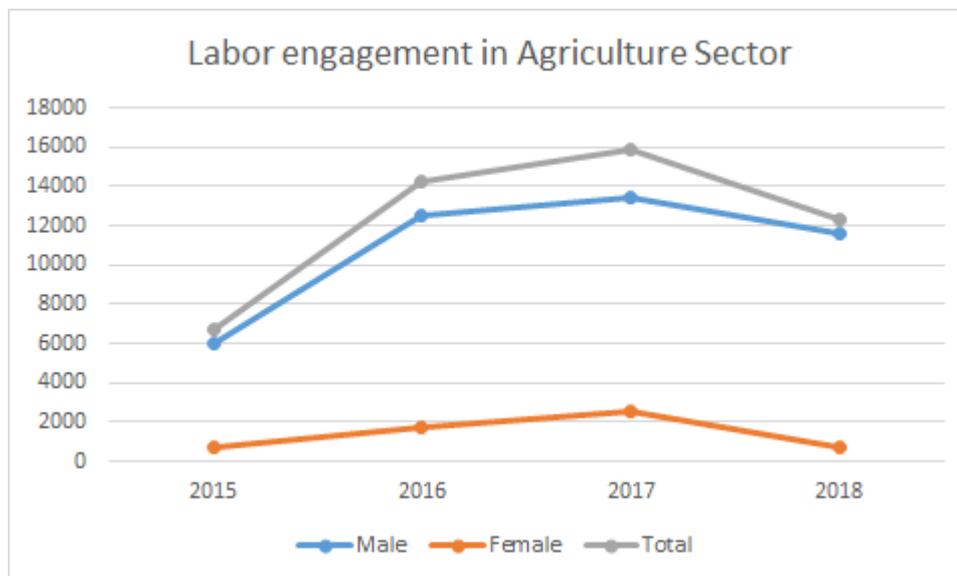
Table 15. Agricultural production in Kosovo through the years

	2015	2016	2017	2018
Crop Production	350700000	412300000	407400000	388300000
Livestock Products	278900000	302400000	298200000	271800000
Agricultural Services	18500000	22100000	22200000	31330000
Total	648100000	736800000	727800000	691430000

Source: Kosovo Agency of Statistics

Despite this decline in 2018, a report of the Ministry shows that since the level of agricultural production and agro processing in the country has increased, the area of agricultural land has increased, new jobs have been created, the export of agricultural products has significantly increased and, to some extent, there is a replacement of imported products by locally produced agricultural products (Ministry of Agriculture of Kosovo 2017). This can be explained in a major part by recent political developments in the country.

The number of people engaged/employed in agriculture has also seen a decline in 2018. That year it fell to 12,300 from 15,900 in 2017, marking only 3.5% of the overall number of employed people in Kosovo. Trends of labor engagement in agriculture are presented in the figure below.



However, these numbers may be distorted by the fact that many people who are engaged in agriculture and produce for their own needs and for trading may not be registered.

3. Methodology of the market research

The future Master of Science in Sustainable food systems will improve the knowledge of future graduates on food systems and the concept of sustainability. The first step of the job market review was the desk research which identified the main actors dealing with the food systems and their awareness and perceptions on sustainability issues. Further, an inventory of the potential stakeholders involved in the food sector was produced with the purpose of classification and sampling.

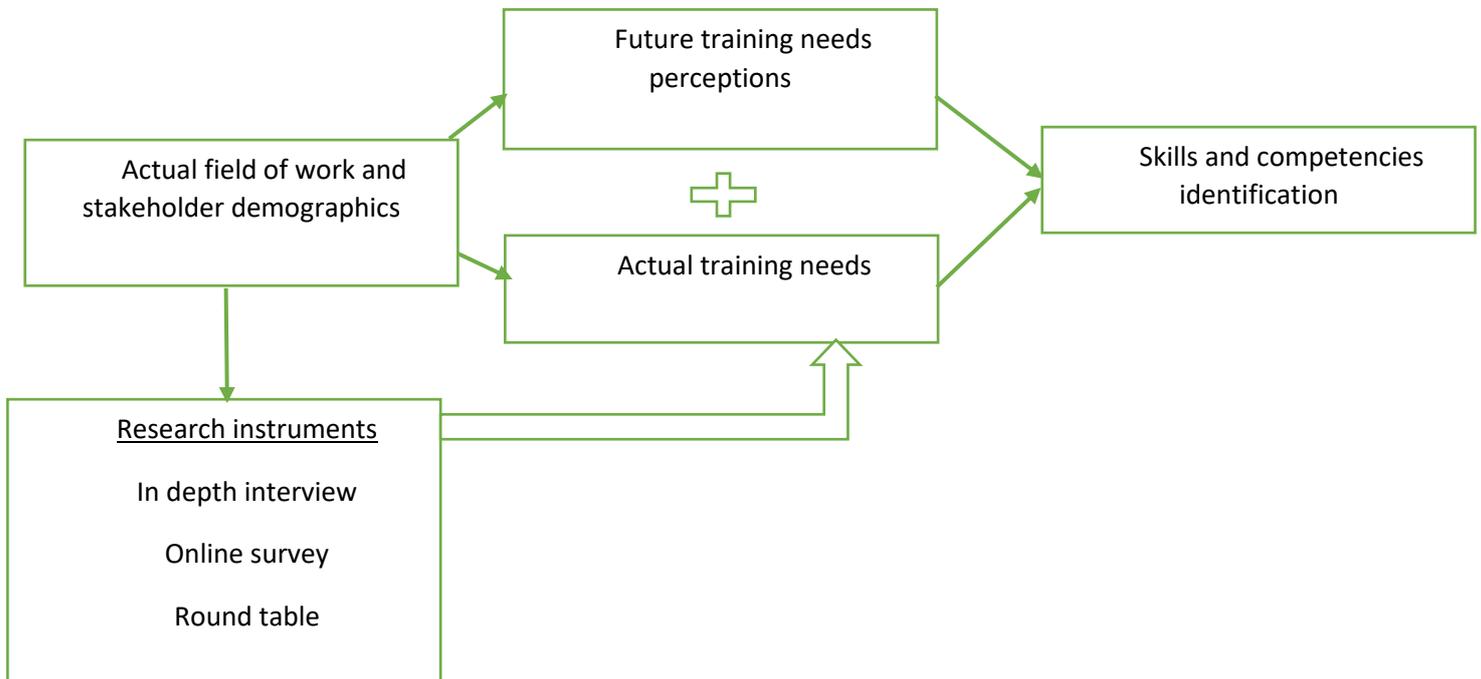
Stakeholder mapping was undertaken using key concepts such as: agribusiness, agriculture sector, agroindustry, food quality, supply chain, farmers, academia and researchers related to these topics. The quadruple helix approach of Eu commission is used for the purpose of stakeholder framing. The respondents are from different backgrounds in several institutions dealing with food sector, more precisely policy makers, agroindustry, agribusiness, national control authorities, food safety authorities, food quality authorities, researchers on the field and finally consumers.

3.1. Research instruments

Several research instruments have been employed in order to identify the competencies and skills needed by the future STEP MSc Sustainable Food Systems Figure 1, such as in-depth interviews, online surveys and focus groups.

3.1.1. In depth interview

In depth interview is undertaken with several stakeholders dealing with food policy, academia, business sector, national and local administration dealing with food systems etcetera see Figure 3. The purpose of this instrument is to collect stakeholder perceptions on sustainable food systems. In depth interview is structured in three main parts: **in the first part** is assessed the dynamic of food productions systems, the perceived changes in the last years, its comparison with the Eu and regional level and the general context of its development taking in consideration social and environmental issues. The second part deals with the perspectives and the market needs, more precisely the questions directed are focused on the actual qualifications, challenges that the workforce is facing and the needed skills to better perform the activities while achieving the objectives, and the level of collaboration with academia and policy sector. In the last part are collected the perceptions of the stakeholders mainly with the future of the sector, how this sector will be developed in the future, what is the role of EU integration and what is the role of the universities and other research bodies in this process.

Figure 1: Step market research conceptual framework


3.1.2. Online survey

Online survey aims to gather a multi-stakeholder perspective on the needs assessment process within the food systems in the respective project partner countries. The online questionnaire is structured as it follows, in the first part are collected demographic data of the respondents such as: the education, size of the organisation, position, years of experience, geographical area, actual sector of employment and the issues they deal with, and also their perceptions related to their training needs and challenges in food system (**questions from 1-9**). These questions will help to understand the different typology of needs in the process of skills and competences identification. In the second part, perceptions on sustainability are collected, these questions are introduced in the online questionnaire in order to understand the perceptions on sustainability from the stakeholder perspective. Even though, these questions are not directly linked with the process of skills identifications it will help to project the skills for the future MSc program and to understand if stakeholders are aware of the sustainability and if the concept of the later is considered in their business (organisation) objectives (questions 9-12).

In the third part the questions 13, 14, 15 deal with the actual needs and future needs. Thirteen skills have included, and the respondents have chosen the required level of proficiency, this question will directly address the future and existing needs in the food system sectors and will allow to produce a typology according to the stakeholders needs.

In the questionnaire are also included questions related to the most important issue related to the food systems in the respective countries, and what is the level of knowledge in their institutions dealing agrobiodiversity and food systems. In depth interviews and online survey helped to identify the competences and the skills that will be validated in the second step of the market research through the round tables.

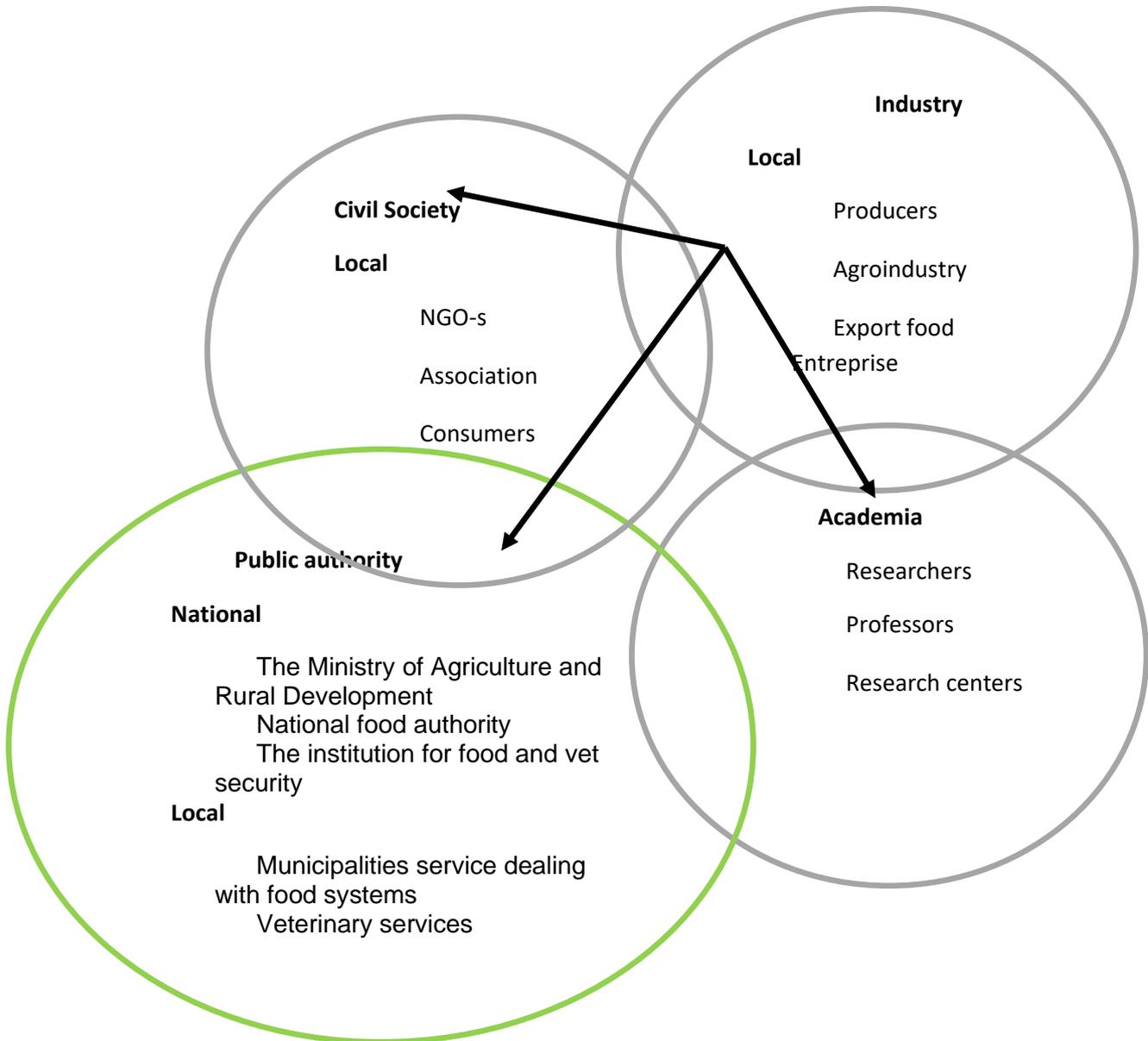
3.1.3. Focus group

In order to have more accurate evaluation of the needs in the respective countries and to identify the competencies and skills within food systems in Albania, Bosnia Herzegovina and Kosovo 30 focus groups (respectively 10 focus groups or/and study visit on each country).

3.2. Sampling

The sampling procedure applied for the purpose of the need assessment varied upon the data collection instrument and its objective. Depending also on the subject which is considered as the potential respondent for the purposes of the study. First the Snowball sampling procedure is applied for governmental and public stakeholders dealing food sector in Albania. According to this sampling technique, the first subject recruited to the sample group, provides multiple referrals. According to Atkinson & Flint, (2001) some of the advantages of this sampling technique are: the ability to recruit hidden populations, collect primary data in a cost-effective manner, plus the survey can be completed in short period of time. However, oversampling of a particular network of peers, is one of the main biases generated by this technique. Related to researchers and academia, google scholar is used to identify potential stakeholders based on published research, such as, food sector, agriculture, food safety and quality, agribusiness, sustainability, nutrition, supply chain management, etcetera. Further, subjects dealing with agribusiness and agro industry will be selected randomly by using the list of the subjects of the National Food Authority and the list provided by the sector of statistics at the Ministry of Agriculture and Rural Development in the case of Albania. Also, by using the partnerships that the universities have established with the business sector.

Figure 2: Stakeholder mapping



Source: UET, AUT, 2019

4. Result analysis

4.1. In depth interview data analysis

4.1.1. In depth interview data analysis Albania

Seventeen in depth interviews have been completed with several stakeholders dealing with food sectors in Albania. The respondents are represented by a variety of sectors such as: food safety sector at the Ministry of Agriculture and Rural Development, Extension service employee at the MARD, Institute of Food Safety and Veterinary services, technical supervisor of slaughterhouses, National food authority, Veterinary service, Consumer protection agency, GIZ and several businesses. The respondents from academia sector, deal mainly with farm management issues, value chain management and agro food economics. From the business sector, the employees work in dairy sector, meat processing, agritourism, olive oil sector, cheese production, etc. They held different work positions, such as technical directors, supervisors, producers, managers etc. The experience within the food sectors of the respondents ranges from 4 years to 25, 41% of the respondents are women. All the respondent has worked only in Albania and did not have any experience with the food systems abroad. In the following paragraphs will be presented a summary of the interviews in relation to all the directed questions.

Table 15: Sample characteristics

Respondent gender	Years of experience	Sector	Area/Region
Respondent 1 M	20	Ministry of Agriculture and Rural development Extension services	Albania, Tirana Central level
Respondent 2 F	21	Ministry of Agriculture and Rural development Food safety sector	Albania Tirana Central level
Respondent 3 M	25	GIZ Rural Development Program Manager	Albania Tirana
Respondent 4 M	20	Academia Professor on agrofood economics Agriculture University of Tirana	Albania Tirana
Respondent 5 M	15	Academia Professor of Farm Management Agriculture University of Tirana	Albania Tirana
Respondent 6 F	5	Academia/ local administration Value chain management	Albania/Permet
Respondent 7 M	12	National food authority	Albania/Vlore

		(AKU) Inspector, food inspector	
Respondent 8 F	25	Consumer protection Agency Sector of veterinary service	Albania/Tirana
Respondent 9 F	19	National food authority (AKU) Inspector, food inspector	Albania/Tirana
Respondent 10 M	4	Business sector Technical supervisor in production unit	Albania/Tirana
Respondent 11 M	7	Public sector Technical supervisor of the public slaughterhouses	Albania/Tirana
Respondent 12 F	8	Business sector Technical director Diary sector	Albania/Tirana
Respondent 13 M	9	Business sector Mrizi i Zanave Agritourism	Regional Lezhe
Respondent 14 F	23	Business sector Shkalla (olive oil production)	Regional Tirana/Lunder
Respondent 15 M	12	Business Sector Cheese production	Regional Malesi e Madhe
Respondent 16 F	6	Public sector Institute of Food Safety and Veterinary	Albania/Tirana National
Respondent 17 M	20	Academia Professor at Agro food department Korca University	Regional

Source: EUT, AUT, 2019

In the first part of the interview are directed general questions on sustainable food production systems. In this part are analysed the responses of the stakeholders dealing with the dynamic of the food systems in Albania, the perceived changes in the last years, the comparison with the region and Eu food systems. In the second part are summarized the responses on market needs.

First part***✓ What is the dynamic of the food sector in Albania?***

The dynamics of the food sector is positive as a result of several issues. First, Albania's urban population growth from the 90-s to today, the rural population decreased from 60 to 40 percent (in fact the rural population is even lower if we count emigration), thus creating the need for processed agro-food products. Second, the opening of Albania with the rest of the world after the fall of communism, is accompanied with the alignment of its food consumption model with EU, which is based heavily on agro-processing economy. Third, since the 1990s, Albanian agriculture has increased its level of production, thereby increasing the need for the agri-food industry to participate in the process of calorie stabilization through processing.

✓ What changes have you noticed during the time you have worked in the industry?

The agri-food sector suffers from several major problems. The high transaction costs, the asymmetry of information, lack of traceability etcetera, rises the difficulty to guarantee the quality of the product. Another important issue dealing with the food sector in Albania is linked with the perceptions of Albanian consumers on the safety and quality of the products. Consumers perceive Albanian agri-food products as generally unsafe with unknown raw materials origin, suspicious and with excessive levels of colorants and additives etc (Guri et al 2019). If the industry succeeds in gaining full consumer confidence, then this will be the biggest step in ensuring their loyalty and competing with imported products. According to a recent food safety survey, consumers with higher incomes were less concerned about food safety for Albanian products because they mainly bought imported products, as opposed to lower income consumers, which contradicts the economic theory (Guri et al 2019). The explanation behind is that the higher the level of income, the higher the concern for food safety, the last is provided by imported products.

The food sector has taken important steps to improve the quality and diversification of the products. Several Albanian brands compete with the imported products and some foreign brands have disappeared from the market. The increased competition forces the agro-processors to increase the effort in product quality and food safety improvements. The increasing awareness from the consumer side regarding the quality and the safety of the products is another important issue that push the industry to act in accordance with that.

✓ How would you describe the food production system in Albania so far?

The development of agri-food systems can be defined as a two-type speed system, from one side, large industrial food processing unit which have intensified their efforts and compete in a larger markets and small unit of production and processing that struggle in the process of quality standardisation. In addition, they have different development stages because they use very different technologies. However, in general perception of the majority of the respondent is that the food production system in Albania has been in a constant process of improvement. In the last 10 years many entities have invested and are producing accordingly to the European standards. Nevertheless, the system is facing inefficiencies because of the poor quality of the raw material in the country compared to countries in the region. In addition, in Albania are lacking professionals with training and skills in quality assurance and control. In the following lines are presented the main issues of the food system in Albania according to the perceptions of the interviewed stakeholders.

- 1.Weak enforcement of food safety and environmental legislation;
- 2.Lack of knowledge on sustainability and the links with the food systems in Albania

3. Lack of enforcement and compliance with standards on slaughtering (hygiene, animal welfare and waste treatment/poor management of municipal slaughterhouses); outdated technologies and production facilities;
4. Poor waste disposal and treatment practices/facilities and technologies and low by-product utilisation. Inadequate animal health management /Prevalence of some animal diseases;
5. Inadequate manure handling practices;
6. Small scale farming, lack of adequate facilities, specialised vehicles and laboratory equipment
7. Processing - inadequate technologies and equipment (especially cheese production); lack of qualified labour (milk processing technology, laboratory, etc.) in rural areas
8. Weak links among actors in the value chain, especially between farmers and processors (milk collection systems);

However as previously noted the Albanian food sector it is functioning it two speed model, from one side the small firms with low capacities and at the other side the big food production, processing enterprises, some of them can compete in a regional level. In the following paragraphs is presented this issue from the respondent's viewpoint.

✓ How does it compare to the regional or European food system?

Albanian agro-food industry with “no escape” will become part of regional and European food industry, however, in the majority of cases it still remains oriented towards the Albanian consumer. Food safety and the lack of traceability of the raw materials are the major problems. The safety is an issue within the overall supply chain. Issues such as the information provided to the consumer on the labels, standard aligning with the EU will be the next giant step that the Albanian agro-industry will make. The number of enterprises in the food sector that can compete in a regional and European level are limited, to mention some of them Gjiofarma, Lufra, Klegen. The enterprises mentioned above, both in technology and quality, can be compared to countries in the region. They compete with the same standards as countries in the region.

✓ How do you see the future of the sector?

The food sector will increase in the future for many reasons. First because of the domestic growing demand and secondly because of the tourism development. Albania is continuously investing in tourism development; the growing number of tourists will also indirectly increase the demand for semi-finished or processed products. This demand is specific at certain times of the year with specific quality characteristics, which at the present, the Albanian agri-food sector responds a little from the quantitative investments. Also from a qualitative point of view, in terms of food safety, further improvements are needed.

Domestic demand will increase steadily, because of consumption increase as a result of revenue growth, this is not only an Albanian trend, but it is also observed in the western countries where the level of income growth is verified. As a consequence, the increase in revenues is accompanied by an increase in demand for processed products.

✓ What is the role of EU Integration?

The integration into the European Union plays an important role as the opening of the negotiations is linked also with an important chapter that deals with the food sector and agriculture. This process will definitely have an impact in terms of safety and quality standards which are expected to improve due to the EU accession. The accession in EU requires the provision of quality system of control, traceability, legislation approximation etcetera. The integration process can open the floor to niche markets for certain products

that are lacking in the European market, especially products coming from quality production systems. The pre-adhesion support schemes to agriculture and food sector, if the agro-food sector will have the possibility to absorb it, will have an important impact in the improvement of the sector especially in meeting the standard of food safety and quality. The EU financial schemes support will have an impact also in the regional competition. According to Agri business representatives, the financial aid will reduce the cost of production and will increase the possibilities to compete in the regional market (this is the case for meat and milk production sector).

EU integration plays an important role in raising the awareness of institutions, business operators and consumers on food quality and safety standards. The EU integration process will also increase the level of awareness on food sustainability issues.

EU integration, has also an important role in the capacity building process, as previously mentioned, the lack of competences and knowledge in all the sectors dealing with food systems, will require a more qualified and responsible labour force. As a consequence, this will also have an impact on the quality of the products.

✓ What is the role of universities?

University plays a multiple role in supporting food sector. First, in terms of developing new techniques, and offering expertise in the technical production process. Second in the divulgation of the new and existing techniques to the other stakeholders such as business and policy making institutions. The University plays an important role in creating opportunities in terms of marketing of agri-food products by offering innovative methods that increase the added value for agri-industrial producers. University has an important role to play in rediscovering traditional practices but revived in current processing conditions. However, the majority of the respondents expected a more substantial support from the universities. Their actual collaboration is mainly focused on the internship of their students. The university has to play another crucial role as an informer of the wide public on food safety issues in cases of misleading episodes developed by media and especially by social media.

Second part

Perspectives on market needs / demands

✓ Do you have qualified work force?

The quality of human resources on the food sector is an important issue. Skills and knowledge on management issues, technical,

✓ What challenges do you face in regard to work force?

The respondents highlighted the following issues

1. Ageing farm population and lack of interest and motivation of youth to consider farming as a main occupation;
2. Insufficient knowledge, information and skills on modern farm management, national and EU standards; weak compliance with standards;
3. Limited vocational training capacity and insufficient range and quality of specialised advisory services;
4. Missing skills in food safety management systems, equipment, laboratories, and as well as knowledge and skills of the labour force in management, entrepreneurial and marketing issues

5. Insufficient knowledge, information and skills on national and EU standards; weak compliance with the standards;
6. Missing or weak food safety management systems, equipment, laboratories, and as well as knowledge and skills of the labour force in this direction;
7. Lack of producers' knowledge of quality requirements and specifications of raw vegetables for food industry /Production does not comply with global GAP/ no body accredited to certify farms at reasonable costs;
8. Poor technological expertise in informal and small wineries;
9. Lack of knowledge of brands and trademarks and their protection;

As previously mentioned, the procedure of respondent selection is made through snow balling and there is a risk of leaving behind key employees/stakeholders. In order to avoid this bias generated from this sampling procedure, online survey is undertaken with the same group of stakeholders as defined in Figure 3. The main findings from the online survey will be presented in the following paragraphs.

4.1.2. In depth interview data analysis- Bosnia Herzegovina

Fifteen in-depth interviews have been completed with several stakeholders dealing with food sectors in Bosnia and Herzegovina. The respondents are represented by a variety of sectors such as: *policymakers, representatives of public institutions in the area of food production system and agricultural, academics and experts, private sector representatives in the area of food production system, agricultural production and agribusiness.*

Respondents from the academic (University) sector were students and professors dealing mainly with food technology, agriculture, farm management, value chain management and agricultural food economics.

Respondents from the government sector and policymakers were representatives of the ministry at the state and cantonal level, Municipalities, Department for Economic Development and Project Management Development agency from region.

From the business sector, employees work in the dairy sector, milk processing, meat processing, vegetable production, fruit processing, agricultural pharmacies, agricultural cooperatives, agritourism, etc. Also from international food business representatives, Nestlé Company, the world's largest food and beverage company, participated in this analysis.

They have held various positions, such as public sector administration, managers, manufacturing technologists, economists, supervisors, manufacturers, resellers, consultants, etc. The experience in the food sectors of respondents ranges from 3.5 to 38 years and over 46 % of the respondents are women. Most of the respondents worked only in Bosnia and Herzegovina, with little experience in food systems abroad. The exception is international - Nestlé Company with extensive and years of experience with food systems worldwide

The following section will present a summary of the interviews in relation to all focus issues.

Table 16: Sample characteristics

<i>Respondent gender</i>	<i>Years of experience</i>	<i>Sector</i>	<i>Area/Region</i>
Respondent 1 F	25	Ministry of Foreign Trade and Economic Relations of Bosnia and Herzegovina, Sector for Agriculture, Food, Forestry and Rural Development National Political	Bosnia and Herzegovina State level
Respondent 2 F	10	USK Development Agency Regional Political	Bosnia and Herzegovina Una-Sana Canton
Respondent 3 M	10	Municipality of Bihać, Department for Economic Development and Project Management Regional Political	Bosnia and Herzegovina Una-Sana Canton Municipality of Bihać
Respondent 4 M	16	Municipality of Gorazde, Utilities, Inspectorate Regional Political	Bosnia and Herzegovina Bosnia-Podrinje Canton - Gorazde
Respondent 5 M	12	Agriculture / Vegetable production Regional Business	Bosnia and Herzegovina Una-Sana Canton
Respondent 6 M	10	Agriculture / Agribusiness / Agricultural cooperatives Regional Business	Bosnia and Herzegovina Una-Sana Canton
Respondent 7 M	15	Food industry / Meat processing Regional Business	Bosnia and Herzegovina Una-Sana Canton
Respondent 8 F	29	Food industry / Production of beer, soft drinks water Regional Business	Bosnia and Herzegovina Una-Sana Canton
Respondent 9 F	38	Food industry / Food and beverage company International Business	World / Switzerland
Respondent 10 F	26	Food industry / Holding	Bosnia and

		National Business	Herzegovina State level, Sarajevo
Respondent 11 F	3,5	Food industry / Fruit processing Regional Business	Bosnia and Herzegovina Brcko District
Respondent 12 F	15	Food industry / Milk processing Regional Business	Bosnia and Herzegovina Sarajevo Canton
Respondent 13 M	9	Food Industry/Milk processing Regional Business	Bosnia and Herzegovina Sarajevo Canton
Respondent 14 M	33	Agribusiness / Agricultural equipment Regional Business	Bosnia and Herzegovina Sarajevo Canton
Respondent 15 M	12	Agribusiness / Agricultural equipment Regional Business	Bosnia and Herzegovina Sarajevo Canton

Source: UNBI, UNSA, 2019

The first part of the discussion addresses general questions about sustainable food production systems and the technological part of the agricultural production and food industry and also summarizes the answers in the field of agribusiness and related topics. This section analyses stakeholder responses to the dynamics of agricultural and food systems, and agribusiness in Bosnia and Herzegovina, which have seen changes in recent years, as compared to the region and the EU food system.

The second part answers the questions of the perspectives of the needs / demands of the market at a national level, and the future of the sector, EU integration and the role of the University.

First part

Understand the term sustainable food production system and involvement in this area

The great number of respondents have a similar anticipation of the subject matter. Most of them consider „sustainable food production system “as a chain or a cycle that includes all the stakeholders of food production, beginning with the primary food production, its processing, storing, transporting, then introducing and applying standards, reaching the market and its final consumers. All this accompanied by the environment protection, rational energy and natural resources management, health safety of products and its effects on the health of its end consumers but also work safety. This term is actually a process that considers food production, processing and distribution of natural resources, good practice, environment and welfare. In Bosnia and Herzegovina, this concept is partially applied in small farms. For the lack of funds and the system, food is being grown in a traditional manner.

Only segments of such a system are partially present. The examinees link the following terms to this system: climate changes, organic production, new approach in food production, recycling, new package, renewable energy, social aspect of food, optimal resource utilization and similar. The respondents have acquired their work experience mostly in Bosnia and Herzegovina, excluding the Nestlé Company, the world's largest food and beverage company, as a representative of an international company. The respondents are mostly

employed in the private sector, agriculture and food processing technology, industry, in the area of public administration (ministries, agencies, and city government) with over 15 years of work experience.

✓ What is interesting / dynamic about this sector in Bosnia and Herzegovina

When asked what is currently of interest in the food production sector through the prism of agriculture and the food industry in Bosnia and Herzegovina, the examinees state, first of all, the gradual transition from traditionally individually produced, towards combined production and joint appearance on the market (the emergence of cooperatives).

What has also been dynamic lately is the introduction of new products, meeting consumer needs, functional products, dynamic marketing, production with as little chemistry as possible, younger consumers seeking more knowledge about the origin of food and wanting to know how it is grown. There is a growing demand for traditional and local quality-tested products. Healthy Nutrition - Seeking more homemade foods while recognizing local products on the market. Change of infrastructure and technology, newer technology, implementation of the most demanding international IFS-type standards in larger companies, development of the necessary personnel, the connection of science and economy. Increasingly, small farmers are getting the idea, at least declaratively, of placing their products in the "organic" food category.

A large percentage of the respondents stated that the potential related to primary agricultural production, organic and halal meat production, honey and juice production is also interesting at the moment. There is market interest in these products. Also, more and more manufacturers are realizing the importance of marketing and promotion as one of its segments and are increasingly paying attention to it. The creativity of these producers within the promotion is interesting. Although there have been significant developments in recent times, unfortunately, significant state support for raising agriculture and the food industry is still lacking.

✓ What changes have you noticed during the time you have worked in the industry?

In this section, respondents cite the increasing demands of export markets in terms of product analysis and control, as well as more demanding and increasingly conscious consumers in terms of health protection and more demanding retail chains. Changes from the beginning are about quality improvement. Food safety has always been important but there is now more required documentation and there are more audits both by regulators and by customers. Initially quality and food safety were primarily the focus of the Quality department. Now everyone must know their role in ensuring that the food meets consumer quality and food safety standards.

Increasing attention is being paid to management systems in the food industry, for the most part, these systems have been introduced in the form of an integrated management system in a particular industry that, in addition, promotes, to a certain extent, sustainable production. Employee education on food conscience, hygiene, workplace hygiene, plant protection, environmental protection is becoming increasingly important. Changes also relate to the introduction of new production and process lines, which has led to an increase in capacity, speed of operation and a reduction in production costs. Consequently, competitiveness has increased. Obtaining export licenses to the EU in milk and chicken processing is ensured, which can be an introduction to the further growth of these industries both in the primary sector and in processing. A new assortment in fruit growing is being introduced in order to achieve a better market position. The last decade has been marked by attempts to adapt production and business in the agro-industry to the standards and

practices existing in the EU. Manufacturers are trying to adapt to market demands but lack sufficient knowledge and other capacities, especially financial ones. When talking about the state's attitude towards agriculture and the food industry, the respondents state that the system is increasingly regulated with the improvement of inspection - veterinary controls and records. The situation is getting better. Maybe slowly but for the better. Incentives improve and become more regular.

Significant changes in meat processing have taken place with the onset and approval of meat exports to outside Bosnia and Herzegovina. When looking at the production system in the food industry, it is noticeable that it has been significantly changed, that is, modernized - new technological solutions, new equipment. Stricter customer requirements have led to the introduction of new legislation and standards. Of course, it was very difficult at first to adopt new work habits, procedures, standards, but now we have an increasing number of educated staff.

✓ How would you describe the food production system in Bosnia and Herzegovina so far, and how does it compare to the regional or European food system?

Food production in Bosnia and Herzegovina is characterized by fragmented possessions, conflicting interests of actors in the value chain and insufficient application of modern knowledge in production, especially in management. The current system is characterized by the transition of state-owned companies to private ownership, which has led to the renovation and start of production, reconstruction of plants and production facilities to the construction of brand-new facilities and plants. The recovery in food production has also been accompanied by the recovery of primary agricultural production, so there is currently an increase in milk production, chicken production, fattening calves and an increase in crop production. From the point of view of food production technology, it is produced in large food companies in accordance with the laws and regulations governing this area, and these laws are increasingly aligned with EU legislation. Such products are under the constant control of certified laboratories and are absolutely safe for the end consumer.

However, food production at smaller farms takes place without the control of quality control and safety, and there is still much work to do in raising awareness of the importance of quality packaging, branding, and protection of geographical origin. Considering the overall situation in BiH, both political and economic, as well as other types of production, it can be said that the food industry or food production is the most developed and regulated of all production, however this is nowhere near the ideal situation, but it largely follows the requirements of the domestic market.

Although the emergence of new and modern technologies in some areas of agriculture and the food industry has been present in recent years, the current food production system in many parts of Bosnia and Herzegovina is still eclectic and is being implemented with obsolete technologies. It is also disorganized, because there are still many small farmers who are not connected to each other due to negative experiences from the previous cooperative social system. It is disconnected from consulting, primary processing and distribution, and many food production institutions have no hearing for processors and producers who often give up production. Many blame the bureaucracy and the state (system at the state, entity and cantonal levels) for this situation, which does not seek to create a positive environment and make it easier for producers, for example. obtaining certain certificates, faster obtaining certain building permits, lobbying and signing certain agreements for easier export to countries of the EU region. In addition to all these recent years, there is a trend of departing working-age population from the country, especially from rural areas. At the same time, respondents greatly emphasize the problem of uncontrolled import of food from other

countries, which of course has a negative impact on the price and quality of these products and has led to the fact that our farmers cannot compete on their own market. The awareness of our citizens that they buy domestic products and thus directly support the advancement of the entire manufacturing sector is not yet represented.

As for the comparison with the European food system, most of the respondents consider that the food production system in Bosnia and Herzegovina is still much lower than the region and Europe due to the business environment and certain difficulties in doing business with the present devaluations of quality, ignorance, not following trends nutrition in the EU, insufficient oversight by inspections, incompetence and staffing shortages.

However, despite all of the above, a large number of interlocutors in this survey nevertheless state that in recent times there has been an increasing number of harmonization and adoption of new food safety laws and the establishment of control bodies in accordance with EU legislation.

Recently, export licenses have been obtained for economic unions (CEFTA and EU) and Turkey for certain food products. It can be said that the food production system is generally trying to comply with EU regulations. There are some differences at the regional level, which is quite logical, however, it can be said that countries in the region face similar problems when it comes to food production.

Second part

Perspectives on market needs / demands

✓ Do you have qualified work force and what challenges do you face in regard to work force?

The respondents highlighted the following issues:

- Qualifications gaps due to population migration to EU countries and aging populations on farms,
- Lack of interest and motivation of young people for agricultural production,
- Incompetence, incompetence and lack of knowledge in the existing workforce,
- Workload of workers with additional jobs for which they are neither competent nor paid,
- Lack of physical - ordinary labour,
- Insufficient information and skills on modern farm management, national and EU standards

✓ What skills are needed for the work force in this sector?

When asked about the skills needed to work in the food technology, agriculture, and business sectors, respondents believe that these are skills that will enable a quality workforce in Bosnia and Herzegovina, and thus improve the quality of food production and processing. The series of knowledge of technologies in agriculture and food industry state the importance of knowing the current state of agriculture and food industry in the country and the region, and what is very important for the future, information on the EU market, in terms of knowledge of standards and export performance. Understanding the technology and the essence of the food production and processing processes themselves, with mastery of working on equipment that is in most cases automated, using IT equipment and sophisticated technology software.

A representative number of respondents points out that we lack knowledge of EU agricultural policy, recognition of market needs, marketing and management, and the social dimension of food. Essential skills

require a constant willingness to constantly learn and embrace innovation, perseverance, specialization in specific areas, enhancing staff training and practice in manufacturing firms, but also desire and motivation.

✓ Do you collaborate with academia?

Cooperation with the academic community is reflected in the implementation of joint projects in the field of agro-food production and agroeconomics, cooperation in the form of lectures and students practice, research and scientific work, engagement of experts from certain departments and fields. Many think the role of the University is crucial. Providing staff who will maintain and enhance the existing level of awareness of the importance of sustainable agriculture and food production, and of all the benefits they bring with them. It is generally believed that the said cooperation is not continuous and at the required level.

✓ What about policy sector?

The prevailing opinion among the respondents is that the political sector in our country is not sufficiently involved in planning further steps regarding food production. Following the response result analysis, it can be seen that the producers mainly point to small and irregular incentives in the agricultural production and food industry, as well as complicated bureaucracy and licensing when starting a business. However, several respondents state that this condition has been improving recently. Also positive is the fact that this has been seen and started with the development of an agricultural development strategy where the government will take concrete measures in which way it will shape its policy in this field in the future. In addition to all of the above, the concepts of protection of domestic production, consumer awareness, import controls, unfair competition are also encountered. The role of the state is an essential prerequisite for the development of the sector.

Perspectives on market needs / demands

✓ How do you see the future of the sector?

The prevailing opinion among the respondents is that the political sector in our country is not sufficiently involved in planning further steps regarding food production. Following the response result analysis, it can be seen that the producers mainly point to small and irregular incentives in the agricultural production and food industry, as well as complicated bureaucracy and licensing when starting a business. However, several respondents state that this condition has been improving recently. Also positive is the fact that this has been seen and started with the development of an agricultural development strategy where the government will take concrete measures in which way it will shape its policy in this field in the future. In addition to all of the above, the concepts of protection of domestic production, consumer awareness, import controls, unfair competition are also encountered. The role of the state is an essential prerequisite for the development of the sector.

✓ What is the role of EU Integration?

In the process of harmonization with EU legislation, 70% belongs to the field of agriculture, and 30% to all other areas of energy, mining, environmental protection, education and the like. According to both producers and public sector representatives, EU integration will play a role in enhancing the competitiveness of domestic producers in the domestic and foreign markets through direct financial assistance.

They should also be reflected in increasing production capacity, and in product quality, through the introduction of new technologies and standards. EU integration is almost always a greater chance for

existing than new members, but new EU integration members should use this as their chance, therefore need a proper preparation. One way of preparation is to educate yourself about systems that are already present in the EU and to combine them with BiH specificities.

EU integration will mean the implementation of a set of EU regulations and directives in the field of food safety (veterinary and phytosanitary policy), the application of requirements and standards in the field of food, and expert staff who can implement all these. EU integration can certainly greatly help to improve food production in Bosnia and Herzegovina, with its policy of incentives and measures to support agribusiness in BiH. The role of EU integration is crucial for this sector. By approximating national legislation with EU regulations, it will contribute to the development of agribusiness, and this is an important factor that can contribute to the advancement of the agricultural and food sectors.

✓ What is the role of universities?

Although the respondents consider the University's role to be crucial, they state that it is still small and underutilized for the needs of agriculture and the food industry. The university as an institution should monitor the state of the sector and adapt the current study programs, i.e make new ones according to the needs of the market but also work on the development of new products.

The university should listen to the needs of manufacturers, organize scientific meetings on these topics. It can also play a key role in providing guidance for improving the quality (food control) and quantity of products, education at various levels of production organization, projects, adoption and implementation of new methodologies, equipment, and implementation of legislation for all stakeholders in the chain: suppliers and manufacturers - processors - consumers.

By producing staff who will maintain and enhance the existing level of awareness of the importance of sustainable food production and all the benefits that come along, represents a crucial role of the University. It is important to emphasize that universities and professors should not aim at science itself for the sake of science, but science for the sake of knowledge that will be applied and that will benefit the community. It is simply the interest of the community, or of the state, for which universities are established. Of course, the research and development function of the University becomes more important. It is certain that the university must be the actor of all events. It is necessary to look at what is currently happening in the sector and educate young people in advance that will compete with a highly demanding market.

✓ Concluding remarks

Discussion with stakeholders during depth interviews resulted in numerous conclusions, the most important of which are the following:

- Sustainable Food Production has potential in Bosnia and Herzegovina
- Application new technologies in food production
- Education of the existing workforce
- Protect the domestic market from illegal competition and imports by better controls
- Increase cooperation with the academic community
- Take all measures to increase exports and competitiveness

4.1.3. In depth interview data analysis- Kosovo

For the study, eight in-depth interviews with relevant actors in the food system in Kosovo were conducted, followed by 11 site visits, and a survey with 60 companies. The data for the study was collected between July 20th, 2019, and August 13th, 2019. The organizations included in in-depth interviews are listed in the table below.

Table 17: Sample characteristics - Kosovo research

Respondent gender	Years of experience	Sector	Area/Region
Respondent 1 F	9	The European Commission Office in Kosovo International political	Kosovo Country level
Respondent 2 M	10	Ministry of Agriculture/ Department for agricultural policies and markets National Political	Kosovo Country level
Respondent 3 M	19	Ministry of agriculture/ Agriculture Development Agency National political	Kosovo Country level
Respondent 4 F	10	USAID Kosovo, Agriculture for Growth and Rural Opportunities International political	Kosovo Country level
Respondent 5 F	10	Food production National business	Kosovo State level
Respondent 6 M	15	Food production National business	Kosovo State level
Respondent 7 M	20	Beverage National business	Kosovo State level
Respondent 8 M	15	Dairy industry National Business	Kosovo State level

Key findings from the in-depth interviews show that food production system in Kosovo is in its early development phase, where some larger companies, despite having achieved to penetrate international markets, still face challenges in finding qualified workforce and financial support for future growth.

What are the most interesting dynamics of the sector in which you work?

According to the USAID, Kosovo program for Agriculture for Growth and Rural Opportunities Project Management Specialist, the current dynamics in the food sector include efforts in presenting new cultures and changing the mindset of farmers for abandoning the traditional crops and focusing on increasing the cultivation of high value crops. These are crops that are suitable for cultivation in Kosovo soil and climate characteristics, require smaller areas of land, are labour intensive, and are of higher value. USAID's focus is in supporting the farmers in cultivating soft fruits (berries), medicinal and aromatic plants, asparagus, saffron, lettuce, cornichon, tomatoes and peppers, fefferoni peppers for which has existed a niche market, top fruits (pears and apples), table grapes, and production of dairy products.

The Head of the Agency for Development of Agriculture in Kosovo, who has been engaged in the agriculture and food sector for 19 years, considers that the development level of Kosovo's agriculture and food production system can be compared to that of 1970s in the EU countries. He says that the sector is growing, however its absorbing capacity is larger than the financial support provided.

Another important development in the sector, as seen by the Director of the Department for Agricultural Policies and Markets, Ministry of Agriculture of Kosovo, is the harmonization of national legislation and policies with those of the European Union and this responsibility falls under his department. Besides this, another important aspect of development in the sector is providing farmers with financial support for increasing their productivity and quality, registration of new and better varieties, registration of high-quality fertilizers, and registration of crop protection products.

In the Peja brewery j.s.c." Birra Peja", they see the easing of tariffs on raw materials and processing lines as a relief and positive development. And thanks to this, he claims that they have reached a better quality and more competitive products in the market. Whereas at the company from "Oreksi", which produces bread and dough products, they value the grain price movements, which directly affect the final price of production.

What are the biggest changes you have noticed during your work in the sector?

The USAID representative claims that a major change in the sector has been the sector's transition to strategic planning based on empirical data. USAID's specific efforts in this regard include drafting a strategy for intervention in the agriculture sector, based on a study conducted in 2009 for assessment of Kosovo's specific conditions for cultivation of each culture and for identification of most and least profitable crops based on the cultivating environment. USAID, within the project, is currently implementing a grant scheme for support to farmers and producers, however, in the future they see their role only as a facilitator in the capacity building process.

According to the representative of Agency for Development of Agriculture in Kosovo, an interesting change in the sector is a decrease in the number of small farms, accompanied by an increase in the number of farms between 2 and 5 hectares, as well as an increase in the export of agricultural products while there is a decrease in the overall export.

Meanwhile, the interviewed companies, speaking from their perspective, claim that an increase in the number of products, market penetration, and brand recognition have been the major achievements in the sector.

Is there sufficient qualified workforce for the needs of your company?

What has been proven by various study reports and has been largely accepted as a fact in the society - the large skills gap in the labour market and the lack of qualified workforce, was raised as an issue by the interviewees in our study as well. AMO Foods, according to their manager, faces great challenges in finding employees with the required qualifications. "There has never been a case that we have turned back a food technologist looking for a job at our company" said the manager, stressing the great need for food technologists in their company. According to him, the company can't find qualified individuals in Kosovo, therefore, they are forced to look for Food Technology students or graduates in Albania and Macedonia, who, however, are not very willing to come and work in Kosovo for an average salary provided by the company. Another problem they face in this regard is that they employ new advanced technology than can only be run by individuals specifically trained for the purpose. Such training is provided in the countries of origin of the technology imported and the company faces difficulties in securing visas for its staff selected for attending these trainings. "Peja Beer" according to Production Director, faces major challenges in finding qualified mechanical and electrical engineering staff, while in terms of technology, has a number of company insureds and is in regular contact with the Faculty of Agribusiness in Peja within the advisory bodies and to date there are three young food technologists employed, as well as a considerable number of practitioners. The situation seems to be better for the other large producer Pestova Sh.p.k., who claim that they face average difficulties in finding qualified workforce.

The public sector seems to be facing similar challenges as well. The representative from the Ministry of Agriculture considers that job descriptions in his department are always evolving, they currently have 22 employees, whose capacities he thinks are limited because the staff is ageing and the other younger employees are inexperienced. Further training is needed, especially for new concepts in the field, such as CMO and other issues that arise constantly as a result of developments in the sector. Short-term trainings are not considered to be sufficient, and higher qualifications are required, starting from qualifications provided from vocational high schools to the academic qualifications provided by higher education institutions.

Similarly, The USAID and Agricultural Development Agency representatives state that there is a large skills gap in the sector. However, they associate this situation with the unwillingness of the business sector for investing in human resources development.

Do you collaborate with academia?

Cooperation between food production sector and academia is considered crucial for the development of the sector by all the interviewees. During our in-depth interviews we found that there are various forms in which the interviewed organizations cooperate with academia. The interviewees claim that the organizations and companies they represent have close cooperation with the academia in various forms. For instance, USAID in Kosovo has agreement with the Faculty of Agriculture of the University of Prishtina for offering internship and employment opportunities to its students. They also support an after-school program called ASET in the Municipality of Prishtina, which aims at helping high school students in developing entrepreneurship and job market skills.

Similarly, the Agricultural Development Agency cooperates with the Agriculture Faculty of the University of Prishtina, with IBC-M, and the Faculty of Agribusiness of University of Peja in receiving students of these institutions for internships in the agency. They are satisfied with the quality and skill level of these students; however, they think there is room for improvement. The Ministry of Agriculture of Kosovo, its Department

for Agricultural Policies and Markets, more specifically, make use of another form of cooperation with academia. The department invites academic staff of the University of Prishtina for participation in its working groups when dealing with various issues regarding the sector. However, they consider that there is no proper cooperation between them and academia when it comes to capacity building. The Department of Agriculture in the Municipality of Peja has a similar cooperation form the University of "Haxhi Zeka" in Peja.

A more interesting form of cooperation between the industry and educational institutions is found in the case of AMO Foods. Their manager explained that the company conducts yearly visits at high schools and presents the students with the opportunities and benefits of engaging in the food production sector. All this with the hope that the number of young people who will continue their studies in the area of food technology and related fields will increase.

Concluding remarks

The majority of the companies and institutions interviewed claim that further qualification and training is needed for the employees in food technology, sustainable supply chain, food legislation, raw material and nutrition, nutrition science, entrepreneurship and development sustainable food production systems. Other skills relevant to food production systems that from the stakeholders are evaluated to be beneficial for further development of the sector are:

- Management of irrigation and fertigation systems and use of software for these purposes;
- Use of information technology in agriculture;
- Lobbying and advocacy for farmers, producers, and traders needs and interests;
- Knowledge of Finances and Insurance processes in agriculture;
- Knowledge of International certification standards and procedures;
- Knowledge of project writing and grant monitoring;
- Efficiency of energy in agricultural cultivation;
- Knowledge of agricultural products treatment in production systems;
- Knowledge of local, national, and EU policy processes; and
- Foreign languages knowledge.

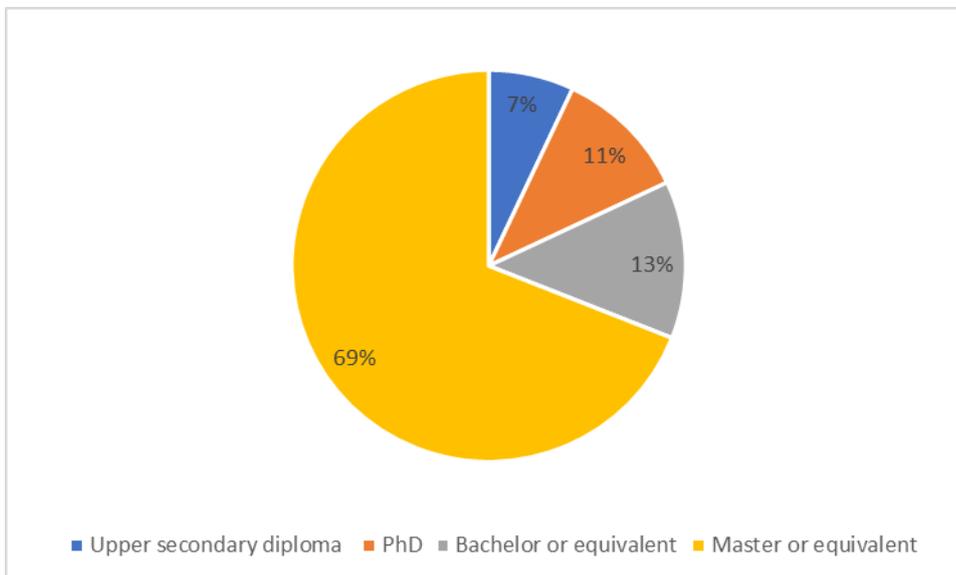
4.2. Online survey data analysis

4.2.1. Online survey data analysis Albania

4.2.1.1. Online sample description

The online survey is another instrument used with the purpose to identify the needed skills and competences in the food sector. About 50 enterprises dealing with the food sector in Albania has completed the questionnaire during June-August,2019. The education level of the respondent is shown in the graph below, 7% of the respondent held upper secondary education diploma, 13% a bachelor or equivalent diploma, 69% of the respondents held as master degree diploma and 11% have a PhD on food systems.

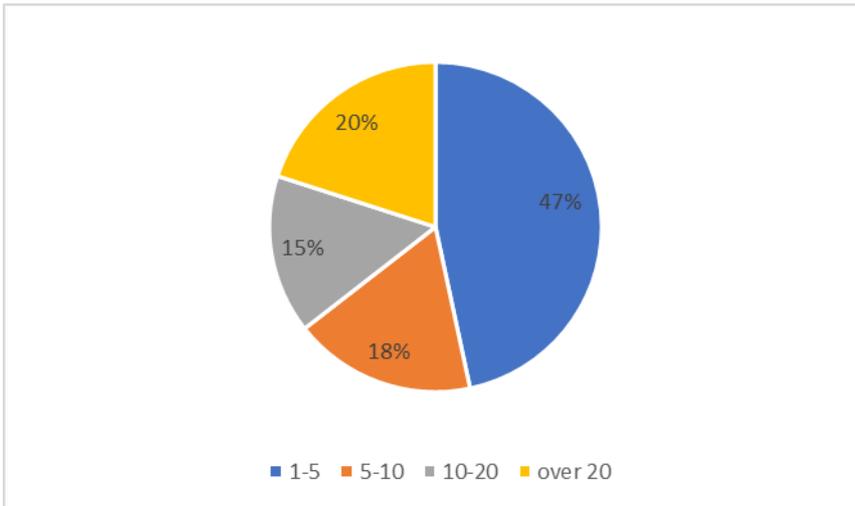
Figure 3: The education level of the respondents



Source: UET, AUT (Google Forms: Online Surveys)

The majority of the interviewees has a master's degree diploma. Professional having a master's degree are well received by the job market even if the diploma is not linked directly with the employing sector. This issue was highlighted even in the open interviews, there is a discrepancy between the skills needed and the specialisation of the employees. The work experience of the respondents varies from 2 to 30 years. As it is presented in the Figure 4 almost half the of the respondents have an experience ranging from 1 to 5 years, 20% of the sample have an experience of more than 20 years. The representatives of all ranges of experiences are a good indicator of data results representativeness.

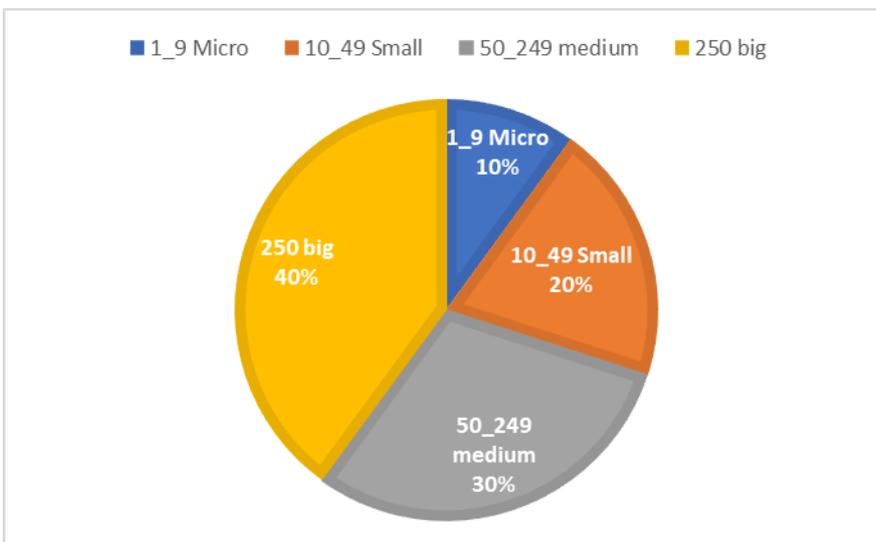
Figure 4: Respondents years of experience



Source: UET, AUT (Google Forms: Online Surveys)

According to the Albanian Institute of Statistics, the classification of enterprises according to the number of employees is as it follows: from 1 to 9 are considered as micro, small enterprises have on average from 10 to 49 employees, 50 to 249 are classified as medium and finally more than 250 are classified as big enterprises.

Figure 5: The size of interviewed companies

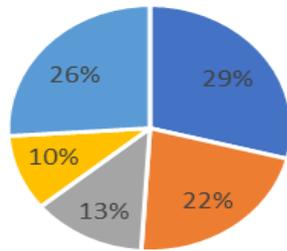


Source: UET, AUT (Google Forms: Online Surveys)

Even though this data does not represent the figures of country this is quite important in understanding the needs in different typologies of firms in the food sector. Regarding the position that the respondents held in their organisation, a multitude of them are represented in this survey. Managers, marketing specialist, engineers in chemistry, food technicians, advisors, consumers protection specialist, retailers, distributors, administrators, technical directors, employees in food control etc.

While, linked to the question -Which one of the following options best describes your current situation on the food sector?

Figure 6: Current situation in the food sector

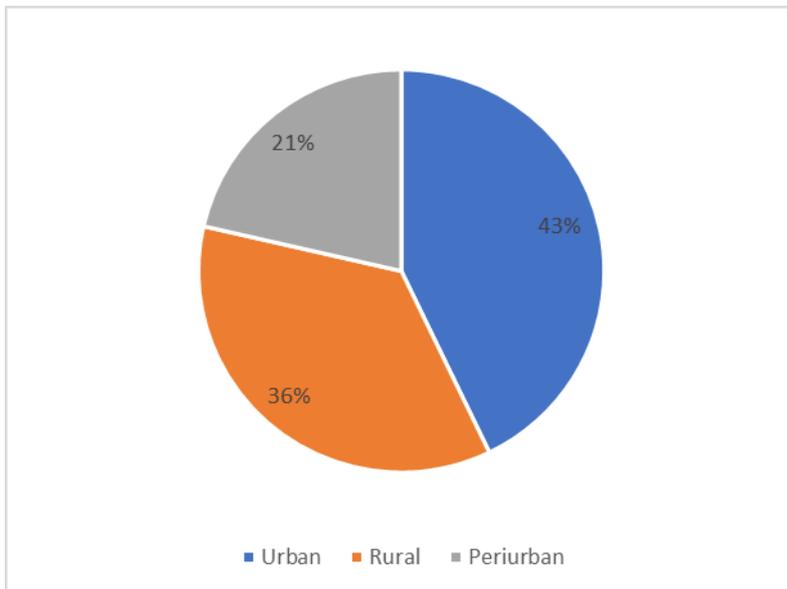


- A staf member of a profit business
- Farmer or business active in the local or regional food projects
- Food processing employee
- Extension services
- other

Source: UET, AUT (Google Forms: Online Surveys)

In the other category, are included, suppliers, retailers, consumers, staff of public agency and NGOs.

Figure 7: Geographical area of operation

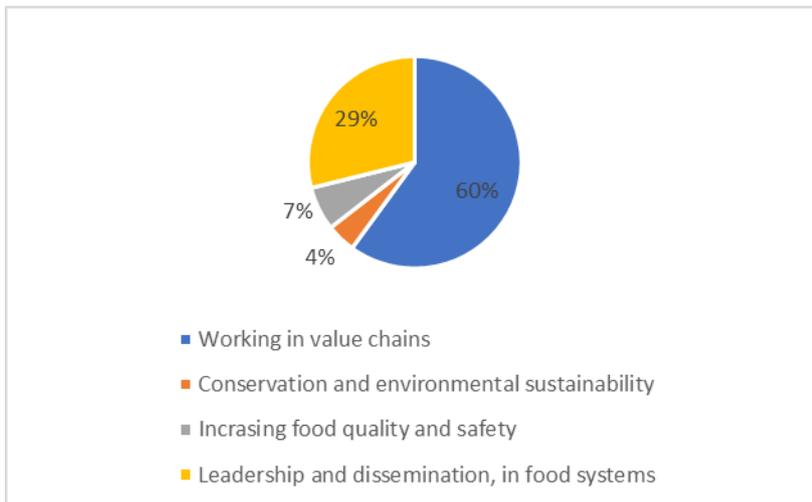


Source: UET, AUT (Google Forms: Online Surveys)

76% of the respondents operate in a national level, 18% in a regional level and only 6% in an international level.

The respondents are asked to list the three key issues that they work on. 60% of the respondents participating in this survey work on value chains, including marketing, processing and distribution infrastructure, 29% work knowledge dissemination, leadership on food systems, system challenges and opportunities and the rest works in food quality and conservation of environment issues.

Figure 8: Respondents actual working issue



Source: UET, AUT (Google Forms: Online Surveys)

4.2.1.2. Sustainability perceptions

The reasons for the strengthening trend toward sustainability are numerous, complex and involving factors both external and internal to the organization. One the most important external factor is the EU future agenda on sustainability. Another complex factor is the role of institutional investors, which will demand more information on companies' sustainability performances in the future. In this framework, taking also in consideration that the future STEP Master of Science, will offer and education curricula in sustainable food systems is quite important to have a clear view of the actual perceptions on sustainability by the managers of food sector participating in the survey.

Four questions have been raised on that purpose:

- What are the factors that the organisation considers as part of sustainability?
- What are the challenges your project, program, organization, or business faces at this time?
- Is pursuing sustainability related strategies necessary to be competitive?
- Has your organisation business model changes as a result of sustainability?

The results from the analysis of these questions show that 45% of the respondents links the sustainability issue with: economic sustainability of the organisation, employee health and well-being, 40% on the increased emphasis on long term perspective, economic sustainability of the organisation and employee health and wellbeing. About 7% links sustainability with the corporate social responsibility and other 7% employee health. The managers reflect the sustainability focused on their economic performance and not in the sustainability of the food system.

About 62% of the respondents considers that the main challenges that the organisation faces are: attaining financial viability, creation of a secure enterprise, finding the sustainable and the basic pattern on which safe

food production will be based and developing experienced leadership. Attaining the financial viability is the main challenge evoked.

About 74% of the participants in this survey considers the pursuit of sustainability strategies necessary to be competitive while the rest maybe will consider it in the future and will not consider. In relation to the third question, about 55% perceive that their business model has changed as a result of sustainability, 30% think that maybe it has changed and 15% expressed a negative answer. These results show that the employee in the food sector is not aware on sustainability and its related strategies with food systems. In addition to that, in the questionnaire is included also the most important issue of the food systems. Topics that can be associated to sustainability such as, environment and food loss and inorganic waste are not considered as important issue. About 70% of the participant in the survey considers food safety and quality the most important issue, 10% food processing and distribution, 10% food production, while health, nutrition, and socio-political is considered as an important issue by 5% of the respondents.

4.2.1.3. Online skills and need assessment

This section will be focused on the need assessment and the identification of the activities that need further trainings on food system, the skills that the current workers need and finally the future knowledge needed by the food sector. At this stage is made an preliminary inventory of the most important skills and knowledges from the stakeholders perspective. The question related to this section are: *-What are the activities that need further trainings on the food systems?*

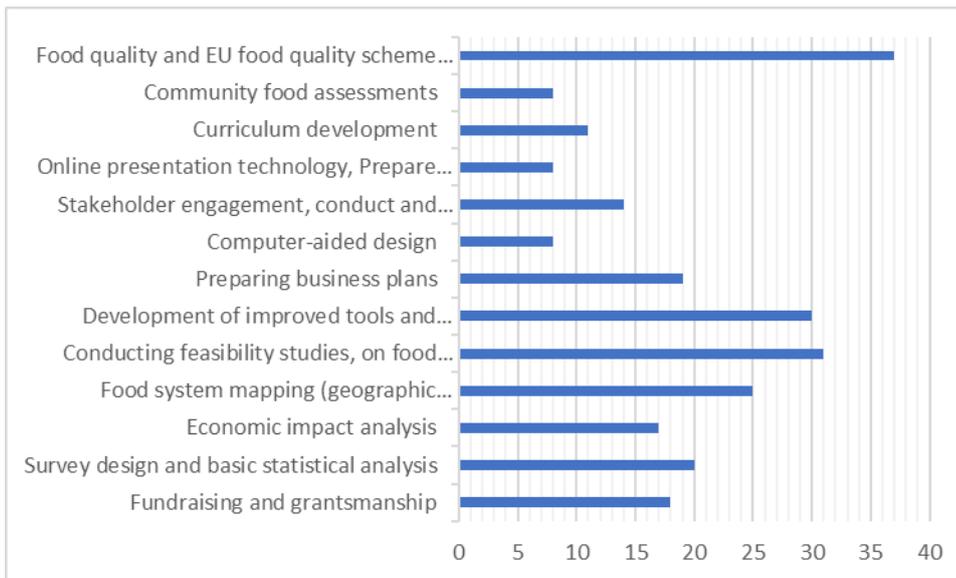
Table 17: Further training needs

- Fundraising and grantsmanship
- Survey design and basic statistical analysis
- Economic impact analysis
- Food system mapping (geographic information systems (GIS))
- Conducting feasibility studies, on food waste and losses on major food value chains
- Development of improved tools and methodologies for food systems analysis
- Preparing business plans
- Computer-aided design (e.g., AutoCAD)
- Stakeholder engagement, conduct and follow-up meetings with policymakers and other stakeholders at the county level in the development of post-harvest reduction strategies
- Online presentation technology, Prepare and submit regular progress reports
- Optimizing the use of social media
- Curriculum development
- Community food assessments
- Other (please specify)
food quality and eu food quality scheme trainings(organic agriculture)

Source: UET, AUT (Google Forms: Online Surveys)

In the Figure 9 it is shown that, Food quality and EU food quality scheme trainings (EU legislation alignment), Conducting feasibility studies, on food waste and losses on major food value chains, Development of improved tools and methodologies for food systems analysis, Food system mapping (geographic information systems (GIS), Survey design and basic statistical analysis and fundraising are the most needed skills by the stakeholders. Optimizing in social media was not evoked as a current need in the activity of the respondents.

Figure 9: Current employee needs



Source: UET, AUT (Google Forms: Online Surveys)

The following question -*What are the skills that the current worker need?* In the following list the participant can chose 4 of the alternatives.

Figure 10: Skills that the current worker need


Source: UET, AUT (Google Forms: Online Surveys)

In addition to skills needed for the current employees, additional questions have been raised in order to identify the future knowledge needs as it follows: *-If you hire an additional employee, what topic and what is the level of proficiency required, from very little proficiency to very high proficiency.*

Table 18: Future knowledge needs

Food technology	<input type="checkbox"/>				
Sustainable supply chain	<input type="checkbox"/>				
Food legislation, Eu legislation	<input type="checkbox"/>				
Introduction to supply chain	<input type="checkbox"/>				
Focus on raw material and nutrition	<input type="checkbox"/>				
Focus on food economics	<input type="checkbox"/>				
Focus on sustainable supply chain	<input type="checkbox"/>				
Focus on communication with consumers	<input type="checkbox"/>				
Social acceptance of new foods	<input type="checkbox"/>				
Alternative food	<input type="checkbox"/>				
Food processing and innovation	<input type="checkbox"/>				
Nutrition science	<input type="checkbox"/>				
Entrepreneurship and sustainable development in food industries	<input type="checkbox"/>				

Source: UET, AUT (Google Forms: Online Surveys)

The responses for this question have been compared in three main group of stakeholders, academia, business and students. The comparison of the level of the proficiency required will give a clear overview of the area where the more knowledge is needed for the future employees in the food systems. From the above listed topics, some proficiency is required for subjects such as: focus on food economics and focus on communication with consumers. While for the other considered topics, high proficiency is required. The results are quite interesting for food processing and innovation. Stakeholders are aware of the innovation processes importance in the food systems.

Table 19: Results on required proficiency level

Knowledge	High and very high proficiency	Some proficiency	Little/very little proficiency
Food technology	84%	11%	5%
Sustainable supply chain	56%	37%	7%
Eu legislation and food policy	56%	37%	7%
Introduction to supply chain	54%	35%	11%
Focus on raw material and nutrition	64%	24%	12%
Focus on food economics	45%	38%	17%
Focus on sustainable supply chain	54%	40%	6%
Focus on communication with the consumer	48%	42%	10%
Social acceptance of new food	58%	30%	12%
Food processing and innovation	67%	24%	9%
Nutrition science	67%	24%	9%
Entrepreneurship and sustainable development in food industry	64%	25%	11%

Source: UET, AUT (Google Forms: Online Surveys)

More than 60% of the online respondents considers that high and very high proficiency is required in the following topics: Knowledge on food technology, food processing and innovation, nutrition science, entrepreneurship and sustainable development in food industry. While more than 50% of the sample reflects that high and very high proficiency is required on: Eu legislation and food policy, sustainable supply chain, social acceptance of new food, introduction to supply chain. From these results we can distinguish the most required knowledges by the respondents.

4.2.2. Online survey data analysis Bosnia Herzegovina

More than 70 enterprises dealing with the food sector in Bosnia and Herzegovina has completed the questionnaire during July-August 2019.

4.2.2.1. Online sample description

The education level of the respondent is shown in the Figure 11. 2,9% of the respondent held upper secondary education diploma and post-secondary non-tertiary education, 15,7% a bachelor or equivalent diploma, 40% of the respondents held as master's degree diploma and 38,6% have a PhD on food systems. A large number of employees with a master's degree (whether in the public or private sector) participated in the survey, which resulted in a high percentage of representation. With the introduction of the Bologna system in BIH, master studies became more accessible, which led to a large number of master's degree holders in the labour market. As a result of a great number of higher education and research institutions taking part in the survey, we got a large percentage of Doctoral or equivalent degree respondents.

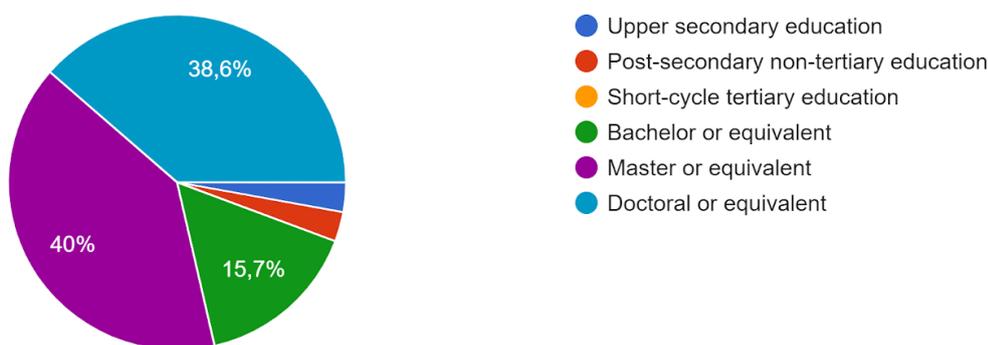
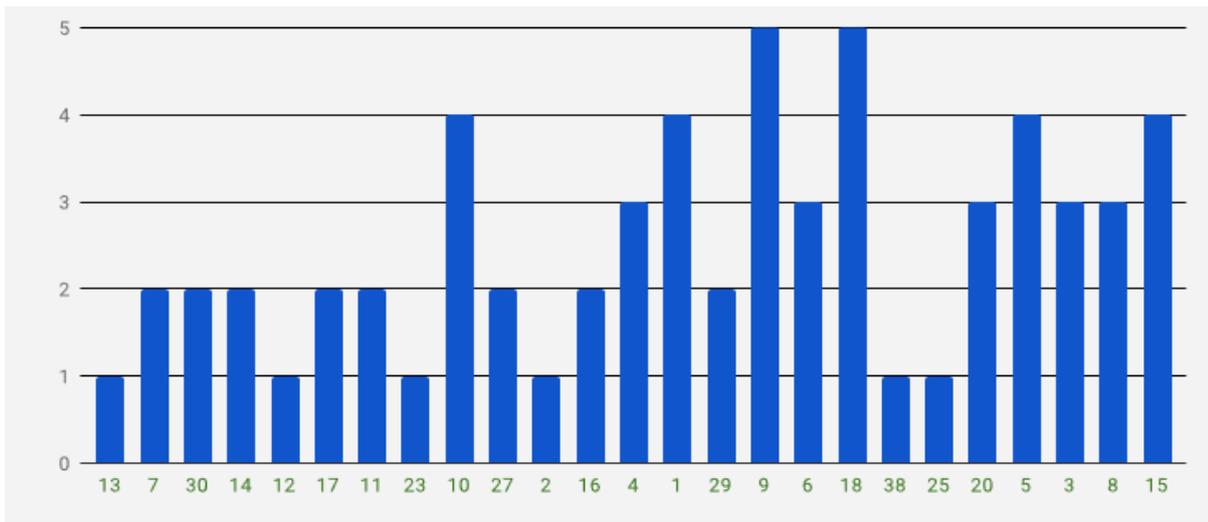


Figure 11: The education level of the respondents

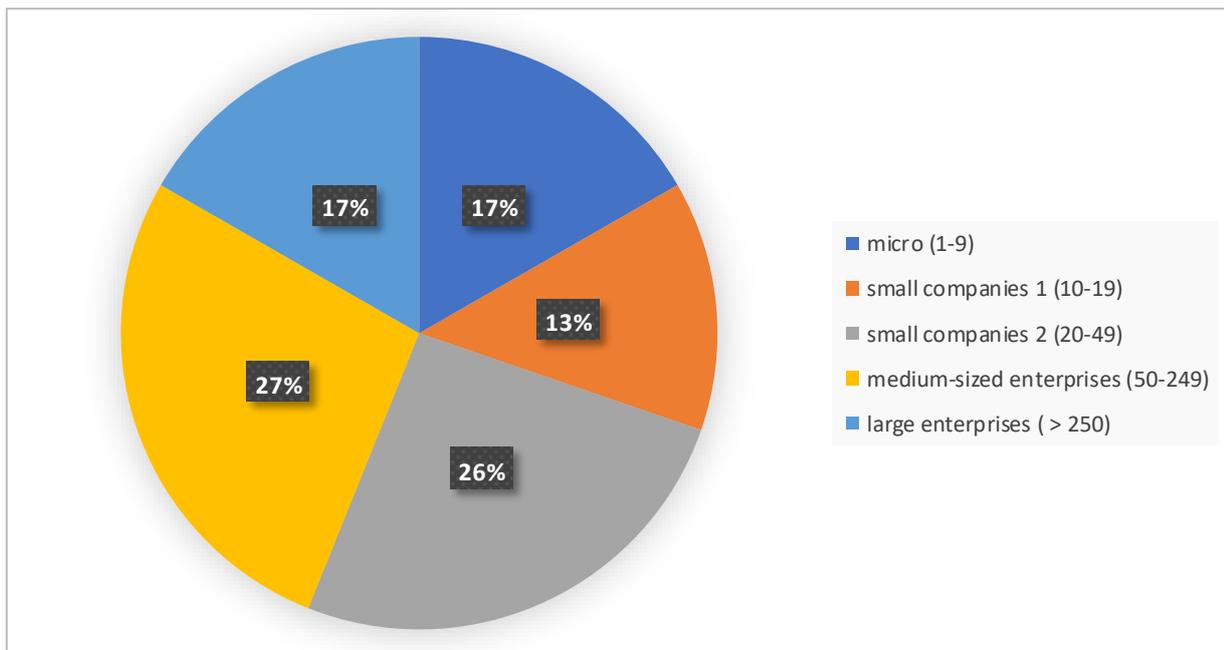
Figure 12: Respondents years of experience



Source: UNBI, UNSA (Google Forms: Free Online)

The work experience of the respondents varies from 1 to 29 years (Figure 12). According to the Agency for Statistics of Bosnia and Herzegovina, the classification of enterprises according to the number of employees is as it follows: from 1 to 9 are considered as micro, small companies 1 have from 10 to 19 employees, small companies 2 have from 20 to 49 employees, 50 to 249 are classified as medium-sized enterprises and finally more than 250 are classified as large enterprises (Figure 13). As shown in Figure 13, small companies 2, with 20 to 49 employees (26%) and medium-sized enterprises with 50 to 249 employees (27%) are most prevalent.

Figure 13: The size of interviewed companies

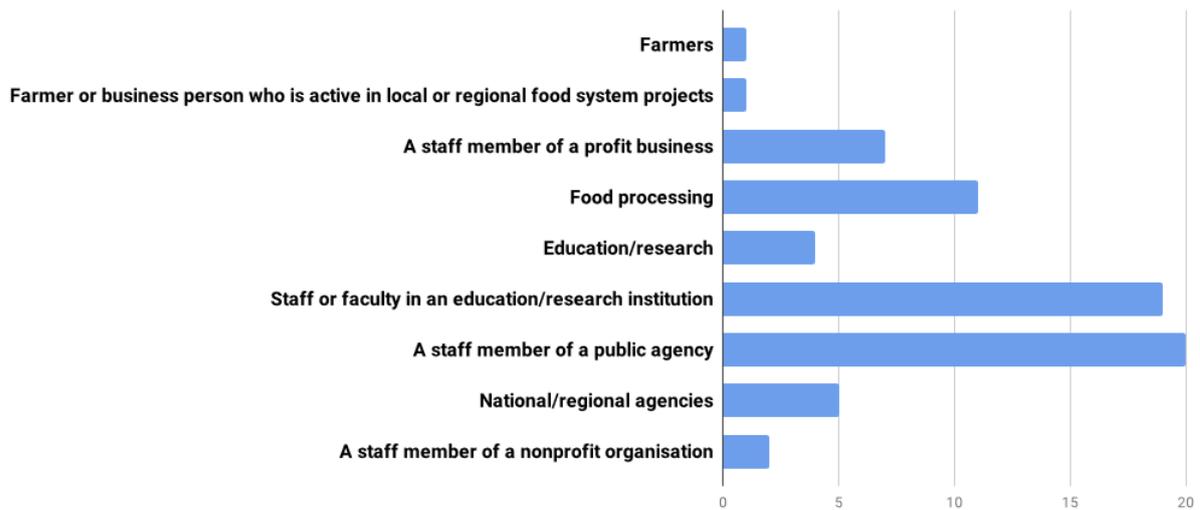


Source: UNBI, UNSA (Google Forms: Free Online)

Even though this data does not represent the figures of country, this is quite important for understanding the needs in different typologies of firms in the food sector. Regarding the attitude of the respondents in their organization, many of the participants in this survey are from Bosnia and Herzegovina, as follows: professor, scientist-researchers, associate expert, manager, secretary, expert advisor, extension service, research project manager, engineer, technologist, project director, consultant, public sectors - Ministry (Source: UNBI, UNSA; Google Forms: Free Online Surveys).

Figure 14: Current professional position in the food sector

Which one of the following options best describes your current situation on the food sector?



Suppliers, retailers, consumers, policymakers, staff of public agencies and NGOs are included into the other category. As it is shown in the figure individuals holding different positions have completed the online questionnaire. Education, research centres, public policies are overrepresented compared to the other categories.

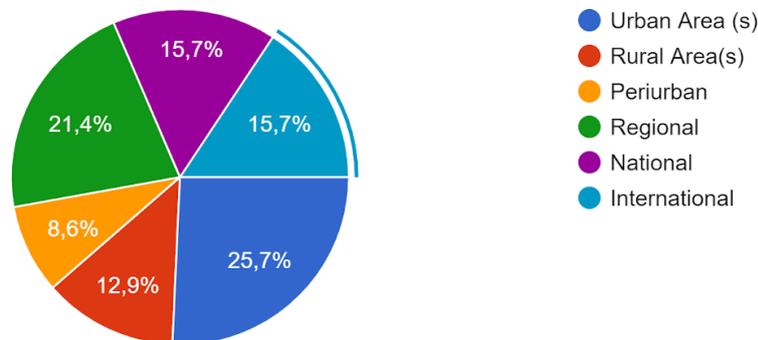


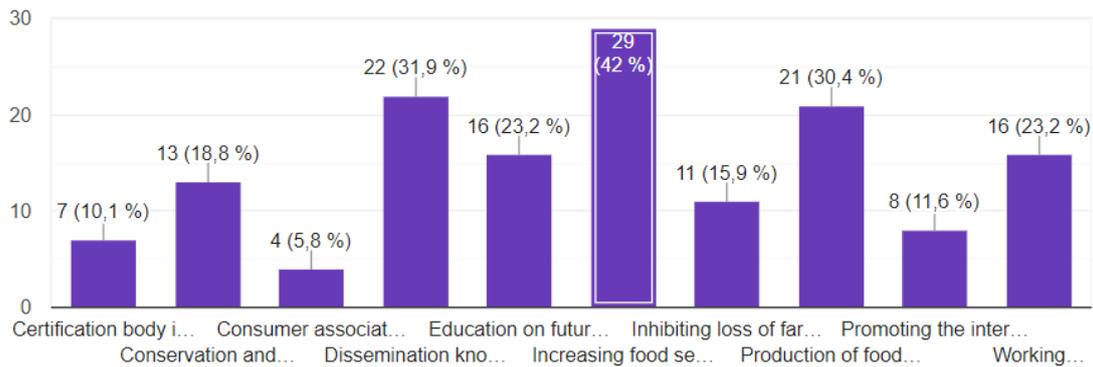
Figure 15: Geographical area of operation

Source: UNBI, UNSA (Google Forms: Free Online Surveys)

As Figure 15 shows, 15,7% of the respondents operate in a national level, 21% in a regional level and only 15,7% in an international level. It is important to point out that a significant proportion of respondents in this survey (21.5%) have businesses in the Rural and Peri urban areas.

Respondents were also asked to indicate Key food system development issues they work on Figure 16. More than 70% of responses responded to areas of Increasing food security and ensuring quality and safe food, as well as Dissemination of knowledge, vision, and/or leadership around food system challenges and opportunities. The lowest percentage was recorded in issues Consumer association (5,8%).

Figure 16: Respondent actual working issue



Source: UNBI, UNSA (Google Forms: Free Online Surveys)

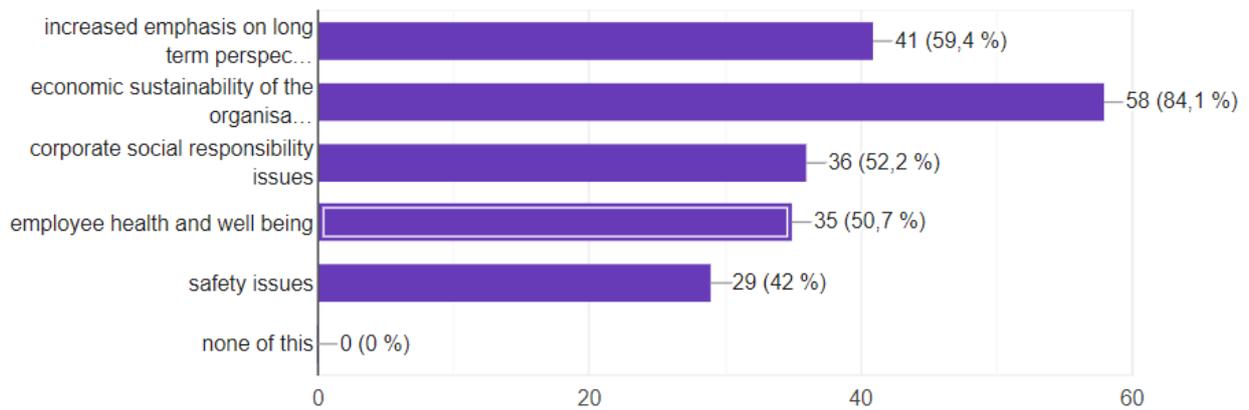
4.2.2.2. Sustainability perceptions

The reasons for strengthening trend toward sustainability are numerous, complex and involve factors both external and internal to the organization. One the most important external factor is the EU future agenda on sustainability. Another complex factor is the role of institutional investors, which will demand more information on companies' sustainability performances in the future. In this framework, taking also in consideration that the future STEP Master of Science, will offer an education curriculum in sustainable food systems is quite important to have a clear view of the actual perceptions on sustainability by the managers of food sector participating in the survey. Three questions have been raised on that purpose:

- What are the factors that the organization considers as part of sustainability?
- Is pursuing sustainability related to strategies necessary to be competitive?
- Has your organization business model changed as a result of sustainability?

The results from the analysis in Bosnia Herzegovina, shows that 84,1% of the respondents links the sustainability of their enterprise with economic sustainability of the organization, about 60% on the increased emphasis on long term perspective, followed by corporate social responsibility and employee wellbeing.

Figure 17: Factors of sustainability

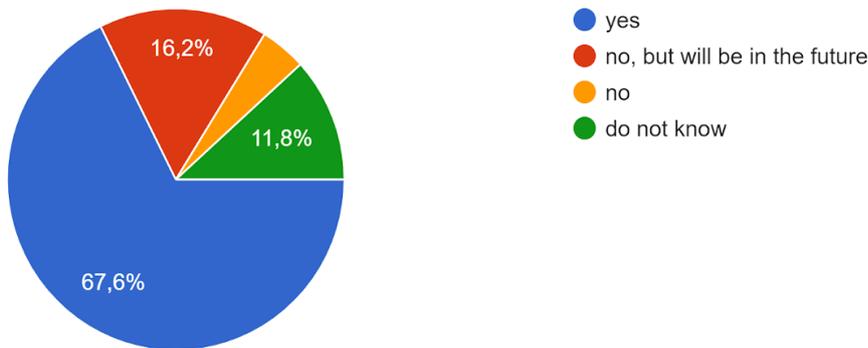


Source: UNBI, UNSA (Google Forms: Free Online Surveys)

Strategy and implementation of sustainability

As can be seen from the following two graphs, the largest number of respondents (67.6%) agree that the implementation of the sustainability strategy is necessary for competitiveness. Also, a large number of answers (40%) were positive when asked about changing the business model of an organization due to the application of sustainability. This is because at some point the stakeholders are aware that in order to comply with the Eu acquis Communautaire they have to embrace the sustainability model in their business.

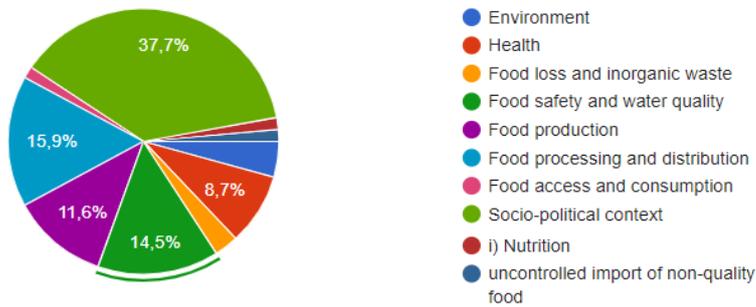
Figure 18: Factors of sustainability - strategies



Source: UNBI, UNSA (Google Forms: Free Online Surveys)

Following the answer on the most important topic to consider, as in the case of Albania, the majority of the respondent considers No. 1 issue in the food system is Food safety and water quality, followed by Food processing and distribution. As it is shown in the graph environment issue is considered important by a small number of respondents. These results are the same for Albania, environment is not considered as an important topic to considered especially by the business sector. These results show also that the employee in the food sector is not fully aware on the sustainability concept and its related strategies within the food systems.

Figure 19: Number 1 issue on the food systems

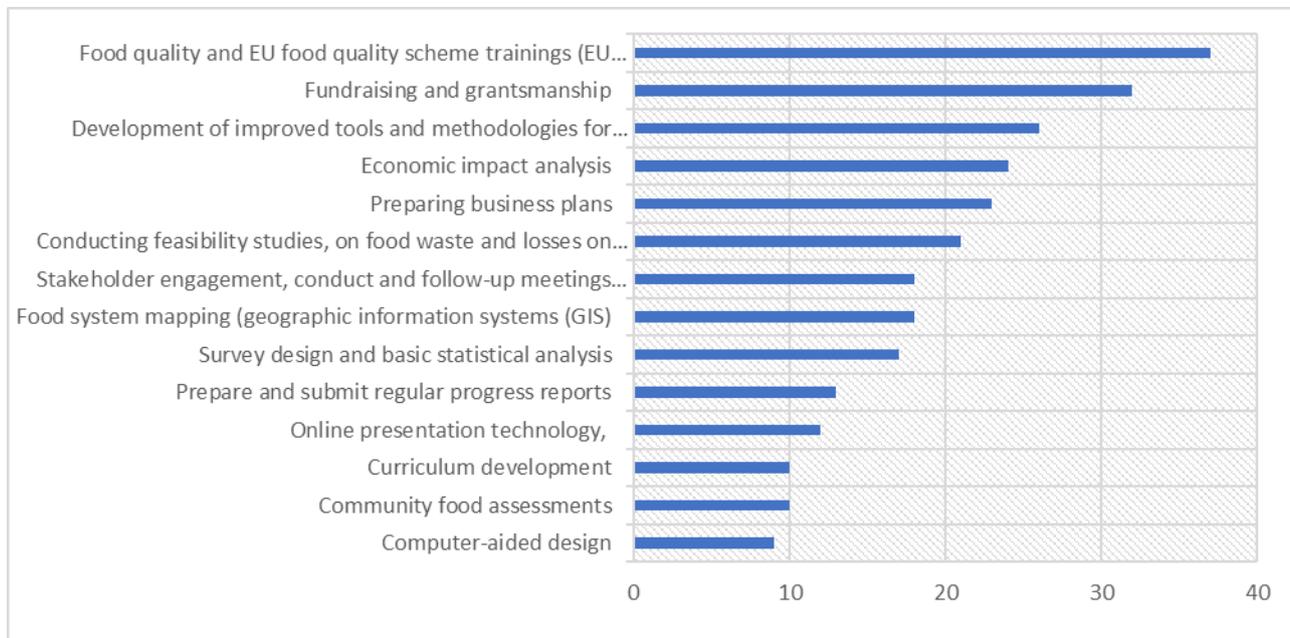


Source: UNBI, UNSA (Google Forms: Free Online Surveys)

4.2.2.3. Online skills and need assessment

This section will be focused on the need assessment and the identification of the activities that need further trainings on food system in Bosnia Herzegovina, the skills that the current workers need and finally the future knowledge needed by the food sector. The question related to this section are: *What are the activities that need further trainings on food systems?*

Figure 20: Current employee needs BH



Source: UNBI, UNSA (Google Forms: Free Online Surveys)

After analysing the response of 70 stakeholders, the most prevalent activities requiring additional training on food systems in Bosnia Herzegovina are Food quality and EU food quality scheme trainings (EU legislation alignment), Fundraising and grantsmanship, Development of improved tools and methodologies for food

systems analysis, Preparing business plans, Economic impact analysis, Conducting feasibility studies on food waste and losses on major food value chains are the most needed skills by the stakeholders (Figure 20).

The following question - *What are the skills that the current worker needs?* In the following list, the participant can choose 4 alternatives.

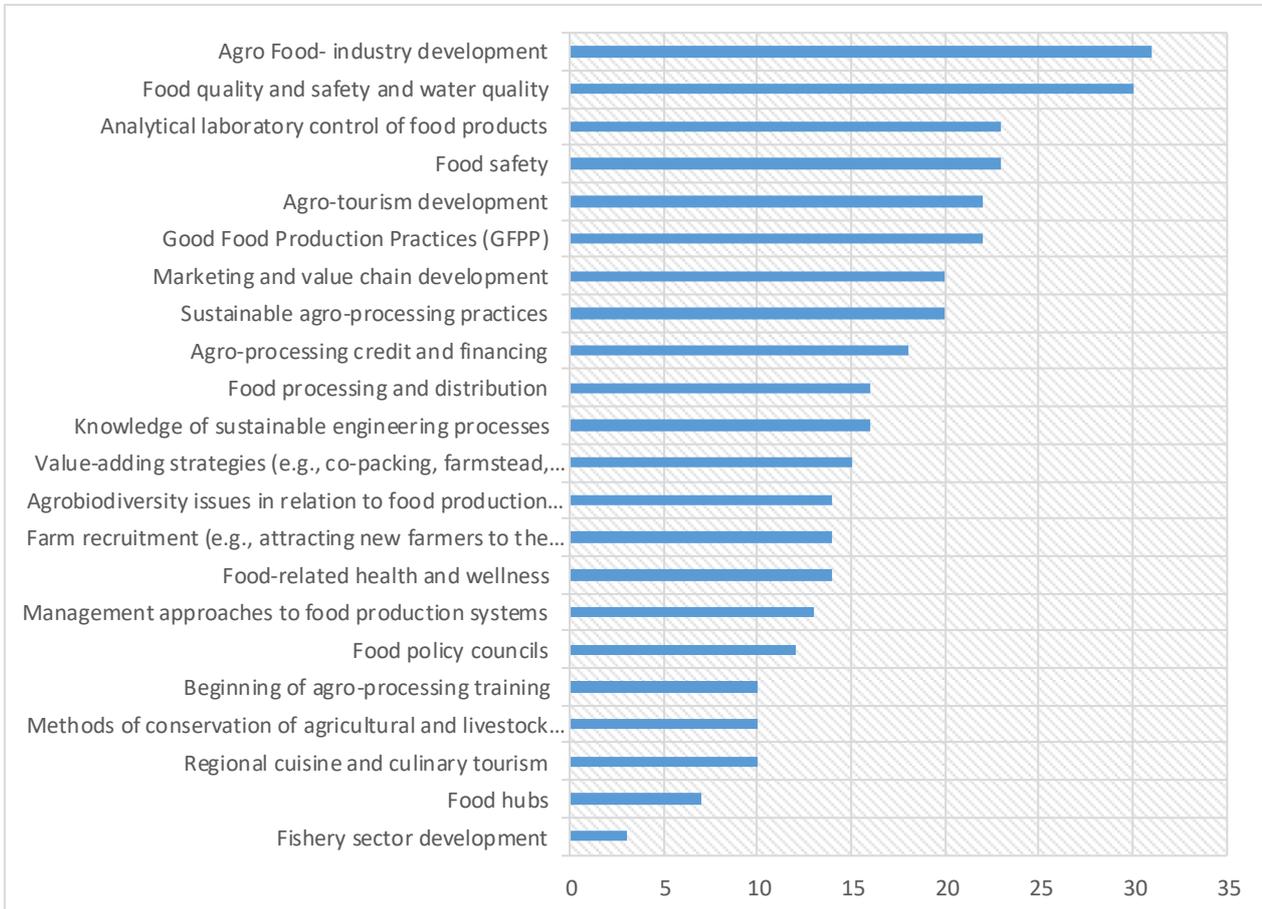


Figure 21: Skills that current worker need in BH

Source: UNBI, UNSA (Google Forms: Free Online Surveys)

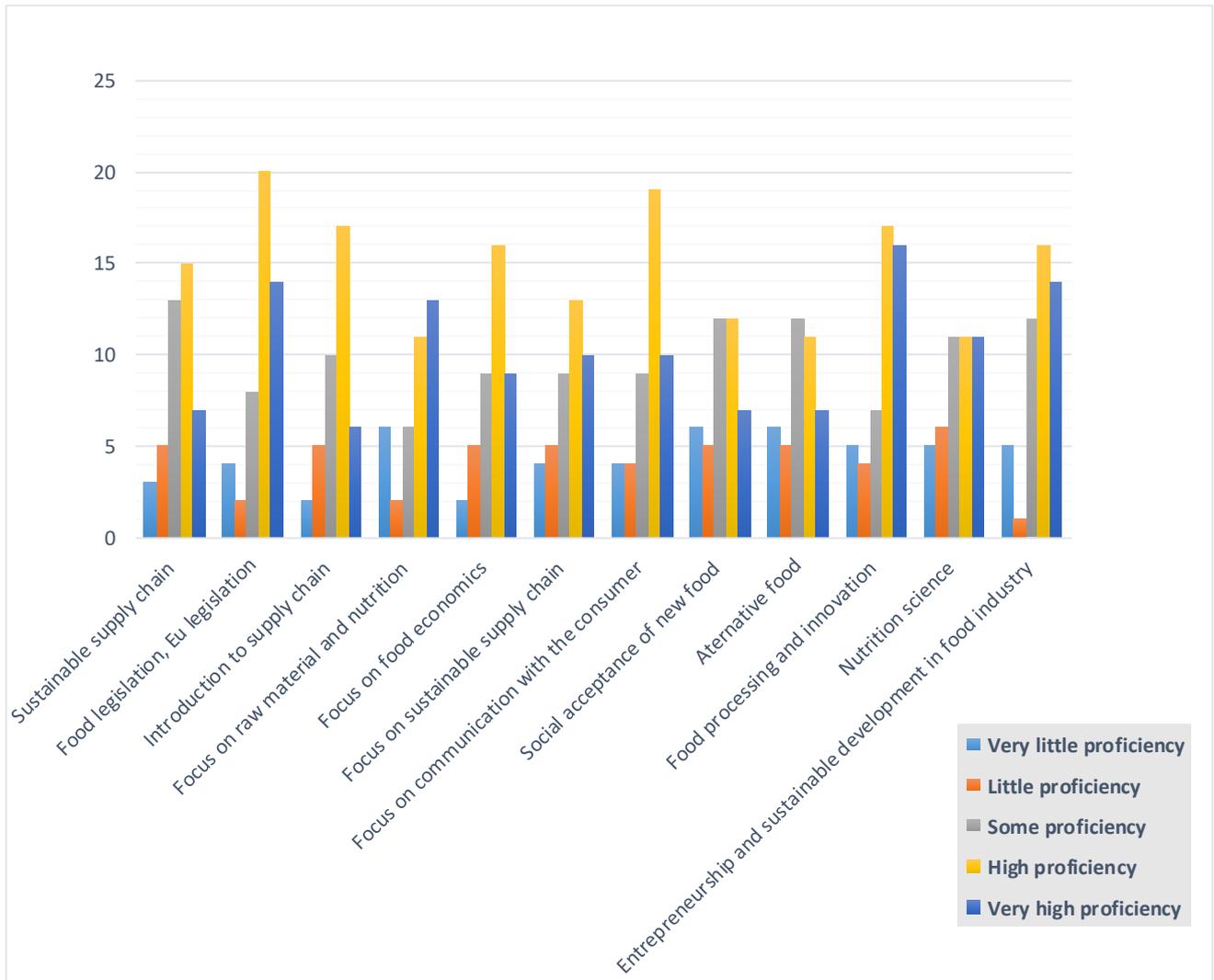
Regarding the skills/training needed for the current worker in BiH, the respondents in the survey gave the highest priority to Agro Food Development and Food quality and safety, as well as to water quality items as shown in Figure 21, which is not surprising, considering the importance of the development of the agro-food industry and the safety/quality of food and water today.

Other items such as: Food safety, Good Food Production Practices (GFPP), Analytical laboratory control of food products, Agro-tourism development, Sustainable agro-processing practices, Marketing and value chain development, were also highly rated. The preference for these topics is due to the likely increased trends in food security, agritourism, sustainable food production and marketing in recent times.

In addition to skills needed for the current employees, additional questions have been raised in order to identify the future knowledge needs, as it follows: - *If you hire an additional employee, what topic and what is the level of proficiency required, from very little proficiency to very high proficiency.*

This Questionnaire is designed to provide feedback from stakeholders from different sectors at the level of knowledge required (high, very high, some, very little and little proficiency), for future workers in the agricultural and food production sectors in BIH. On the basis of collected data, an overview of sectors that need a higher level of knowledge will be created.

Figure 22: Future knowledge needs BH



Source: UNBI, UNSA (Google Forms: Free Online Surveys)

As Figure 22 shows, for most of the above listed topics (food legislation - EU legislation, focus on raw materials and nutrition, focus on food economics, focus on sustainable supply chain, focus on communication with the end consumer, food processing and innovation, entrepreneurship and sustainable development in the food industry, nutrition science), high and very high proficiency is required.

For other topics, like sustainable supply chain, introduction to supply chain, social acceptance of new food, alternative food and alternative food stakeholders indicated some or high proficiency.

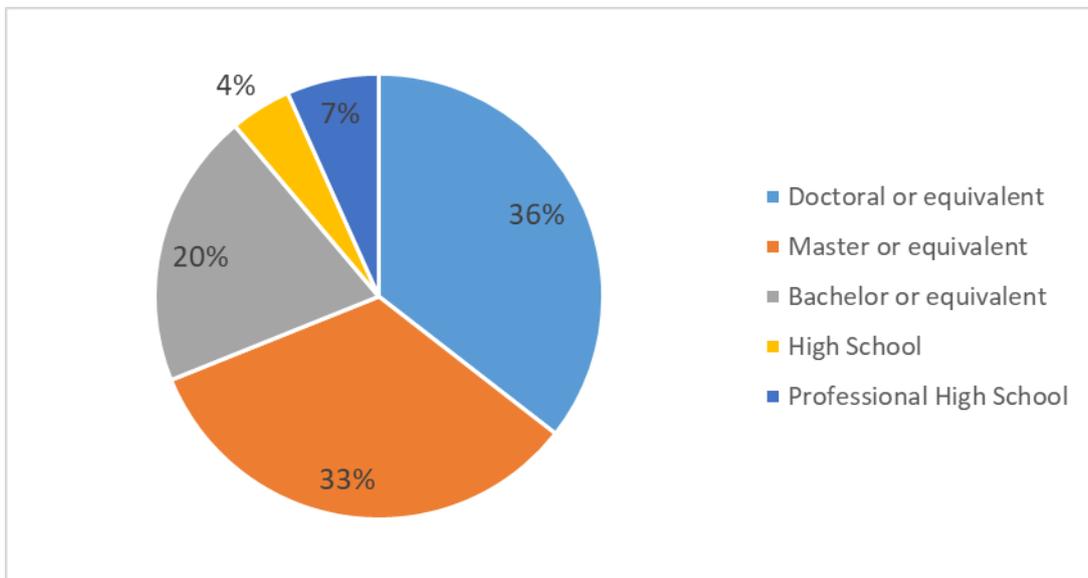
4.2.3. Online survey data analysis Kosovo

4.2.3.1. Online sample description

For the research in Kosovo, 60 online surveys were conducted. Respondents of the survey were local and national companies, higher education institutions and other relevant actors in the field of food production system, whose activities range from agriculture production to food trading and food and drink services. The findings emerging from the collected data are presented below.

The respondents were first asked about their educational experience, and from the responses we see that most of the respondents or 36% of the total have doctoral or equivalent qualifications. Second were the respondents with master or equivalent education level, who comprise 33% of the total number of respondents, while those with bachelor or equivalent qualification comprise only 20% of the respondents. Results shown in the graph below.

Figure 23: The education level of the respondent Kosovo



Source: UC, UHZ Google form online survey

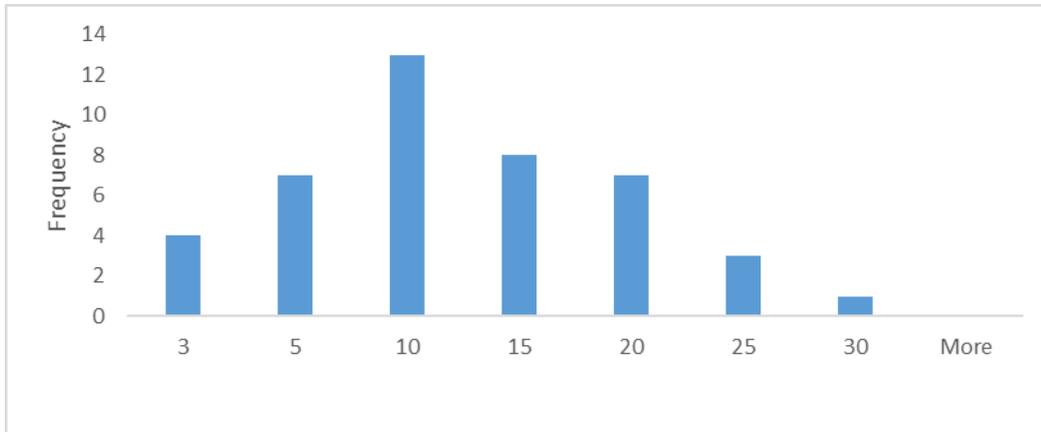
Regarding the number of employees in their companies, the respondents declared that the average number of employees is 83, with 13.8% of the interviewees claiming that their companies/organizations have a total of 18 employees, and the other part of the surveyed organizations/companies having a diverse number of employees ranging from 1 to 437.

In the question concerning the position of the respondents in their businesses, the largest portion or 33.3% answered that they serve there as managers. Other positions held in the companies by several representatives that had the same percentage, 6.7% each, were economist, production manager, sales manager and others.

When asked on how long the respondents have been working at their respective companies, most of the respondents or 30% responded that they had up to ten years of work experience, followed by those who have up to 15 years of experience and consist of 19% of all the respondents, and 16% of respondents who

have up to five and up to twenty years of experience, respectively. The other representatives from the companies answered that they had an experience which ranged from six months to thirty years.

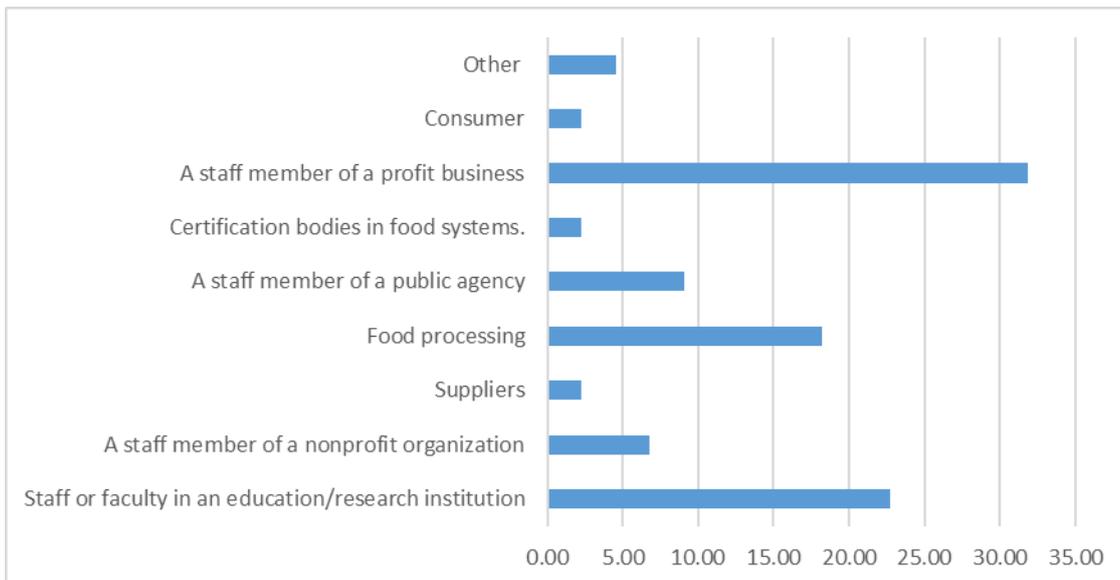
Figure 24: Respondent years of experience



Source: UC, UHZ Google form online survey

Concerning the role and position of the respondents within the food sector, 31.82% of the respondents declared that they were employees of a private business in the food industry. Another large part of the respondents were staff members of education/research institutions (22.73%), while the other respondents declared they worked in such capacities as working in the processing industry (18.18%), working as a staff member of a public agency (9.09%) and others.

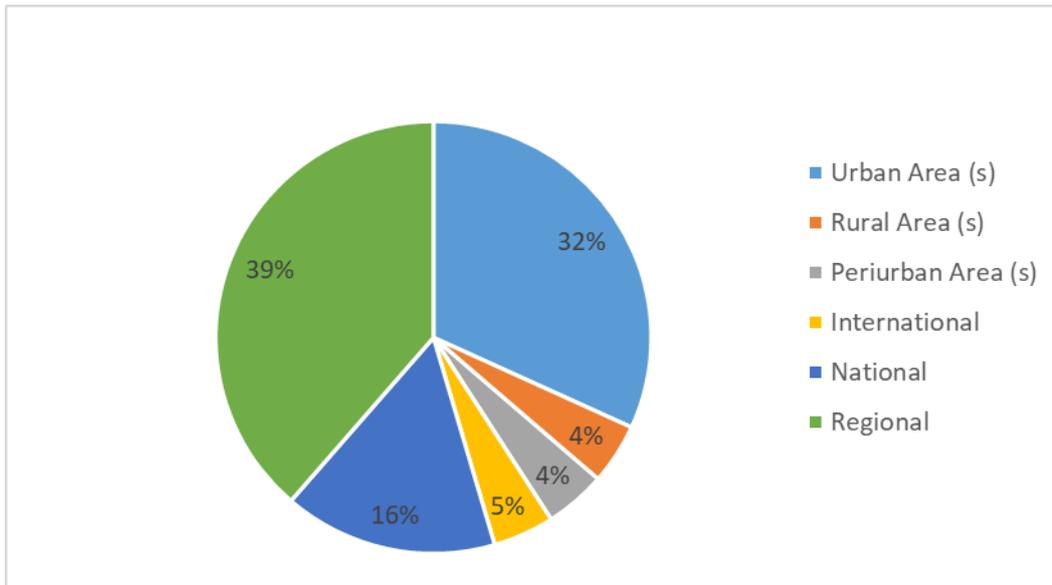
Figure 25: Current situation in the food sector



Source: UC, UHZ Google form online survey

In the next question the surveyed representatives were asked regarding the zone where their businesses operated. As shown in the picture below, the largest portion of representatives declared that they worked in the regional level, 39% of them, more specifically. 32% of the respondents reported that they work in urban areas, followed by those working on the national level, with 16%. Only 4% of the interviewed representatives operated in rural areas.

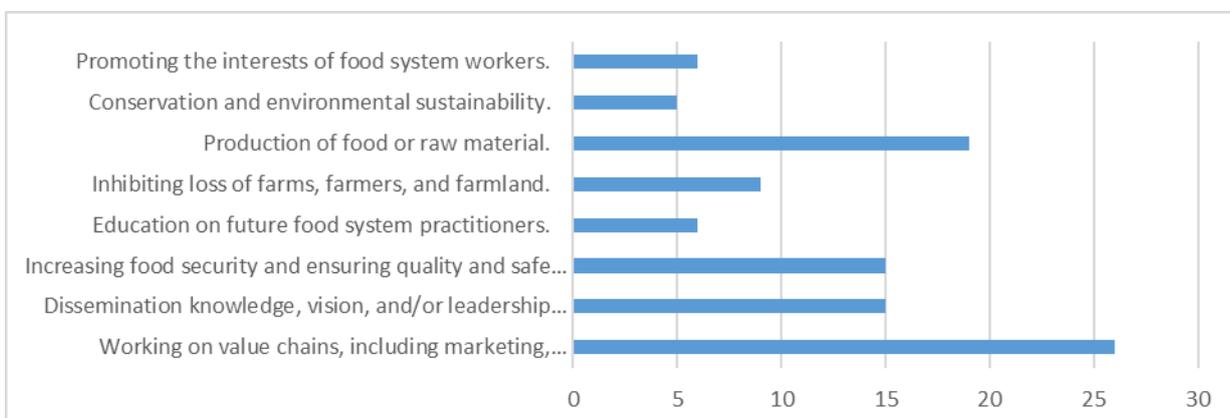
Figure 26: Geographical area of the operation



Source: UC, UHZ Google form online survey

When asked regarding the issues in which the businesses were focused, “Working on value chains, including marketing, processing, and distribution” was chosen most frequently by respondents as a focus area, in 59% of the cases more specifically. Followed by “Production of food or raw materials” with 43%, and “Dissemination knowledge, vision, and/or leadership around food system challenges and opportunities” and “Increasing food security and ensuring quality and safe food”, each mentioned in 34% of the cases. It is worth mentioning that “Conservation and environmental sustainability” is was most rarely picked by respondents, in only 11% of the cases.

Figure 27: Respondent actual working issues



Source: UC, UHZ Google form online survey

4.2.3.2. Sustainability perceptions

When the companies were asked regarding the factors that comprise their stability (sustainability) strategy, most companies (71% of the total) named safety issues as their most important stability factor, followed by economic stability of the organization (64%), and employee health and wellbeing (57%).

Figure 28: Organizations' sustainability strategy



Source: UC, UHZ Google form online survey

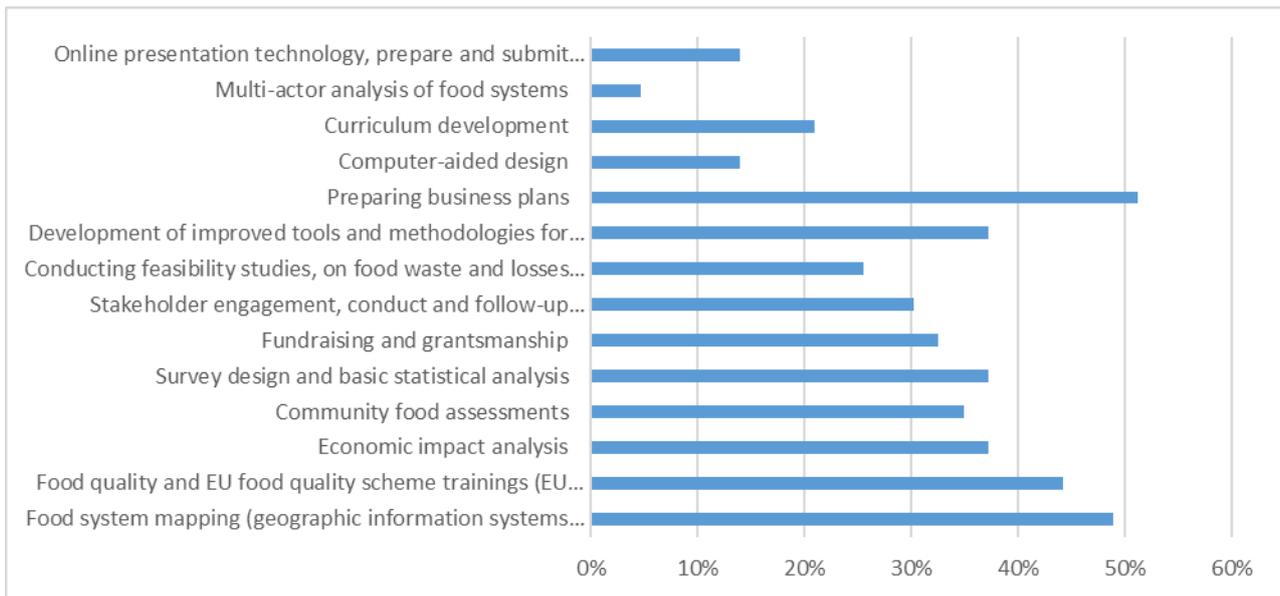
A large portion of respondents, or 77% of them, concluded that stability (sustainability) is an important strategy for them to be competitive in the market, with 16% claiming that it is not currently but will be in the future.

In the question whether the business model of the companies has changed as a result of the stability, 57% of the companies were affirmative in this aspect. 31% of the companies declared that maybe it has, 7% claimed that it hasn't changed, while only 5% of the companies answered that they did not know whether the business model had changed as a result of the stability. When considering the means that would help the companies increase their productivity, 84% of them claimed that training of current employees would be helpful, 33% claimed that recruiting additional employees would be helpful, while only 2% claimed that no changes are needed.

4.2.3.3. Online skills and need assessment

When asked regarding the activities in the food industry which need additional educational preparation, 51% of the interviewed companies declared that preparing business plans was particularly important. Next, 49% of the companies responded that additional education and training is needed in food system mapping, while 44% of them declare that additional training is needed in food quality and EU training schemes. Following, 37% of respondents consider that development of improved methodologies and survey design and basic statistical analysis knowledge is needed. A smaller number (37%) chose economic impact analysis and (33%) fundraising and grantsmanship as fields in which more preparation was needed.

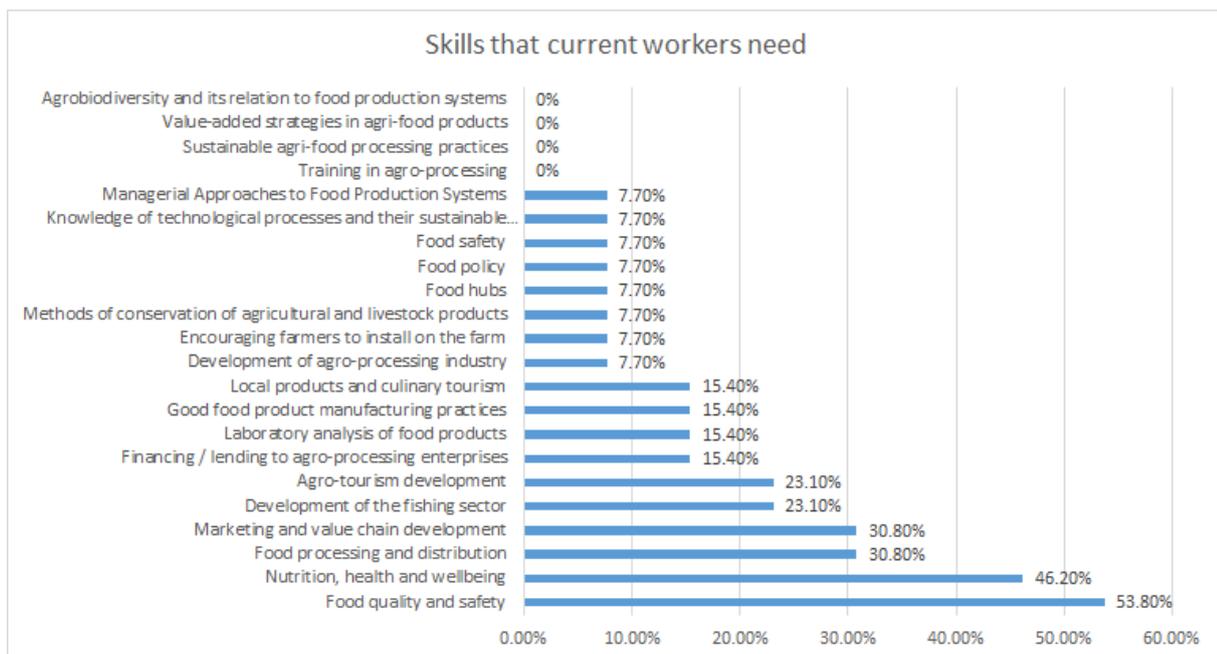
Figure 29: Further training needs Kosovo



Source: UC, UHZ Google form online survey

The following question-What are the skills that the current worker need? In the following list the participants could chose 4 of the alternatives. The results show that among the skills most needed for the current workers in the food sector, as seen by the interviewed companies, are Food Quality and Safety which was chosen by 53.8% of the companies, followed by Nutrition, Health and Wellbeing with 46.2%. The third most needed skill were Marketing and Value Chain Development and Food Processing and Distribution with 30.8% each. Other needed skills were Agro Tourism Development and Development of the Fishing Sector, each of them being selected by 23.1% of the applicants. More detailed results are presented in the figure below.

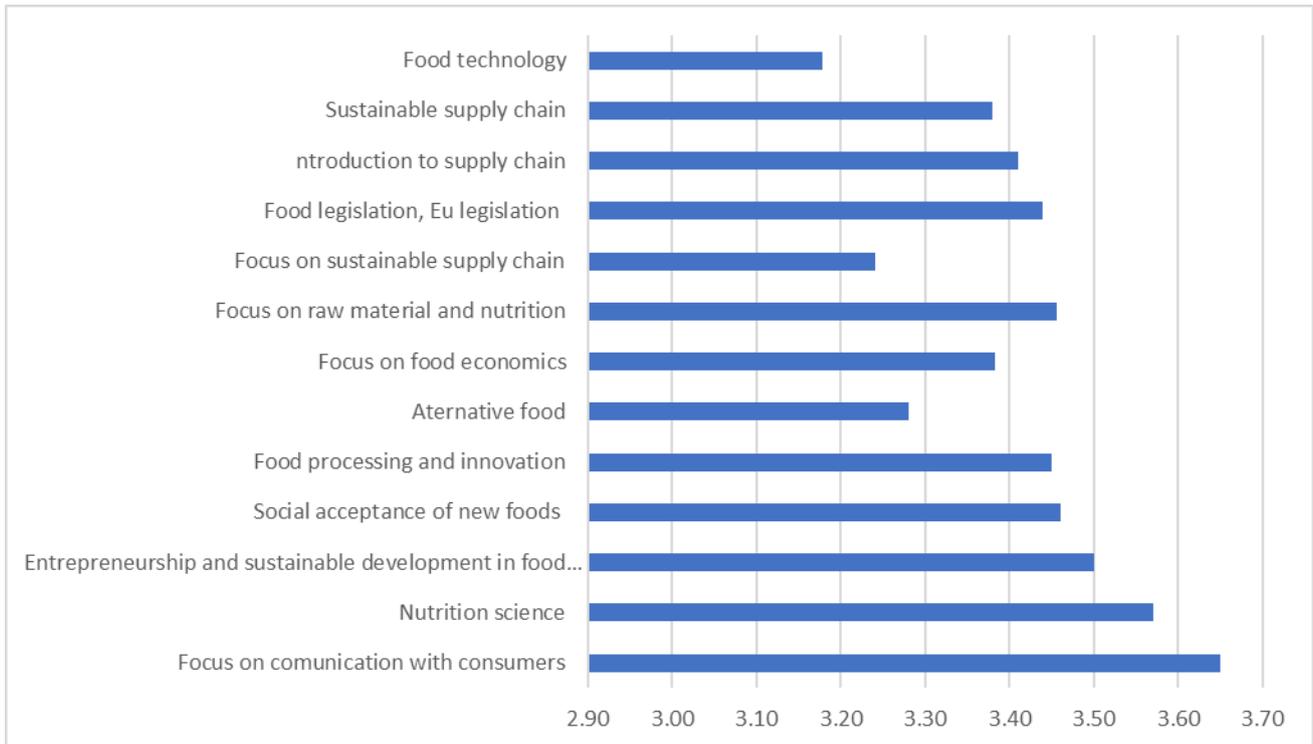
Figure 30. Skills that current workers need in Kosovo



Source: US, UHZ Google form online survey

The study showed that in Kosovo, the aspect of food production with the highest required level of skills is “Focus on communication with consumer”. The companies rated the required level of knowledge in this field with a score of 3.65 out of 5. Next, “Nutrition Science” was the aspect with a level of required skills of 3.57. The rest of the aspects of food production were assessed by the respondents to require an average level of skills, ranging from 3.18 to 3.50.

Figure 30: Future knowledge needs Kosovo



Source: US, UHZ Google form online survey

The companies seem to have academia as their favourite body for getting advice on food production systems. When asked where do the companies ask for advice in order to improve the activities of the organization, 42% of the surveyed companies declared that they ask for such advice from academia, 30% claimed that they receive advice from private consultants, 21% claimed that they receive advice from government agencies, 5% don't receive advice from anyone and only 2% receive advice from NGOs.

4.3. Focus groups/study visit data analysis

4.3.1. Focus groups/study visit data analysis Albania

Round tables and study visit information analysis

As presented in the methodology section, in addition to open interviews and online survey, focus groups and study visits are undertaken. The data gathered from these instruments will give a clearer view of the food

sector in general and precisely to the issues linked to sustainability in the food sector. The stakeholders involved in the round tables, have presented their perceptions on the skills and the competences that are lacking in public sector at central and local level, business sector, civil society etc.

The round tables in the case of Albania are used also as a validation stage of the skills and competences evaluated through online questionnaire. For this purpose, during this step, the researchers have distributed another follow-up questionnaire based on Borich need assessment model. According to this model, the process of identifying training needs can be conceptualized as a discrepancy analysis that identify the two polar positions of what is and what should be (Borich, 1980). The discrepancy between these two poles can then be used as an index of the training programs and can be reflected further in its improvement.

According to Borich, (1980) model these discrepancies can be used to prioritize the importance of the needed skills in order to achieve the educational goals. This questionnaire was optional⁹. Taking into consideration that the two mentioned instruments, have been completed by different stakeholders dealing with sustainable food sector in Albania, the application of Borich need assessment model can be used as a validation step in the market research process. All the participants to the focus group are asked to rate first the relevance/importance of each competency to their current job of future job function and second the level of their current attainment of each competency. A response of one will indicate that the competency is not important and five indicates that the competency is very important to their success. The respondent will also rate the perceived competence level using again a five-point Likert Scale. A discrepancy score for each respondent on each professional competency will be calculated by taking the importance rating minus the ability rating. In the following figures are presented the skills and the importance given by the focus group participants.

At the beginning of each round table, in introductory word the moderators explained the aims of discussion to the participants. They were also informed about ethical aspect of the discussion and called to express their thoughts freely. All participants signed consent form at the closing of the discussion.

Table 20: Sample characteristics round table and study visits

<i>Round table</i>	<i>Location</i>	<i>Stakeholder</i>	<i>Number of participants</i>		
			<i>M</i>	<i>F</i>	<i>Total</i>
1.	Tirana	Researchers	7	10	17
2.	Tirana	Researchers	7	10	17
3.	Tirana	Students	5	12	17

⁹ Bosnia Herzegovina and Kosovo have not applied the questionnaire (it was not foreseen in the research indicators of the project).

4.	Tirana	Agribusiness sector	2	5	7
5.	Tirana	NGO, administration, agribussines	2	8	9
Study visit					
1.	Tirana	Miell Tirana (flour processing)	4	4	8
2.	Tirana	KMY (Meat processing)	4	3	7
3.	Tirana	Olive oil	2	4	6
4.	Tirana	Mozzarella Italia (diary production)	2	7	9
5.	Tirana	Meat importing and processing business	3	5	8
Total	10		38	68	106

Source: UET, AUT,2019

Groups for round tables and study visits were heterogeneous in terms of age and work experience. The last range from 1 to 20 years. They hold a diploma in the three levels, bachelor master and PhD. Roundtable for students was held with the Master students of the Faculty of Biotechnology and Food at the Agriculture University of Tirana. Researchers and professor round table was undertaken at from Faculty of Biotechnology and Food at the Agriculture University of Tirana. The study visits were organized by AUT and UET with food processors, in several sectors as shown in the Table 20.

General questions on sustainable food production systems

Understanding sustainable food production systems

Most of the participant are familiar with the concept of sustainable development in general, but, when it comes to sustainable food production systems, participants did not have clear idea about the concept of sustainability. Their understanding was quite partial, referring to, for example, to food safety. Food safety is an important issue to consider in Albania due to the lack of capacities not only in laboratories but also in technical skills and law enforcement.

According to the round table participants, the food safety system is not efficient, due to the small size of farms and food unit processing and production. However, this problem can be resolved by the application of value-added certifications schemes. These certification schemes can be successful only if the producers and other value chain actors to cooperate with each other. These perceptions have been recorded in almost all the stakeholders in the round tables/study visits.

What is currently interesting/dynamic in the sector

When dealing with the dynamic of the sector, the stakeholders have outlined the reduced capacities of the human capital and the law enforcement related to waste management in the food sector (meat and olive oil processing sector). The producers do not have the competences on food control and other procedures related to waste management. The collection of municipal solid waste (MSW) is provided in most cities and towns but rarely in rural areas. The waste is mainly disposed of at municipal dumpsites. There are no data available for industrial waste. Also, people perceive an imbalance between the new legal framework that complies with EU standards and the limited human and financial resources and waste management practices available.

What changes have you noticed during the time you have worked in the industry?

The changes that have taken place in recent decades in the food sector in Albania are multifaceted, moving in different directions. Despite the generally poor picture of the country's sector and the many burdens and obstacles it faces, there are notable examples of manufacturers, processors, distributors, that have undertaken processes of modernization, intensification and profitability (Miell Tirana, Kmy etc).

All participants at round tables and study visits emphasized that public sector, especially the extension services lack capacities, skills and knowledges in sustainability concept and its application in the food systems. Furthermore, the lack of soft skills and communication among the actors, the lack of trust are some of the main issues dealing with the difficulties in implementing sustainability models in Albania.

The sustainability being an issue of the food sector or not, is strongly related with the concept of social capital, and more precisely with the level of cooperation. The cooperation of the business sector with the public sector and academia is one the pillar of the sustainable development of the food sector.

- Another important point evoked in the round table discussion is the climate change and the adoption of the varieties accordingly. In this direction the cooperation between the universities is crucial. Thus, the lack of theoretical and practical skills in waste management, innovation, management, market research. Uncontrolled and inefficient use of natural resources, including overexploitation;
- Degradation of agricultural land and soil erosion in some parts of the country due to inadequate farming techniques, non-application of crop rotation, low and unbalanced use of organic and mineral fertilizers, ineffective measures for plant protection;
- Pollution caused by poor waste management systems;
- Deforestation;
- Low environmental and climate change awareness of farmers;
- Lack of knowledge and skills on sustainable agriculture practices;
- Weak enforcement of legislation.

According to the focus group participants, extension services have an important role to play not only toward the vulgarisation of the techniques and procedures relating the sustainable food systems but also rising awareness to the actors of the civil society and business sector. Communication is another important factor to be considered, actually in Albania the business sector is harmed because of the lack of information (the fake news), in this condition the future students should have practical skills in managing these situations.

As for the food processing the changes could be summarised as follows:

- Technology innovation, equipment automatization, increased IT involvement;

- The problem of waste management is becoming a major problem that requires huge financial investments,
- Implementation of management systems in all segments of food production and distribution becomes more demanding and challenging;
- Increasing needs for sophisticated analysis to ensure food safety for demanding foreign markets;
- Market and competition require continuous progress in terms of product quality, and in this direction, companies are undergoing certain transformations in terms of meeting product quality assurance and product standardization, which requires investing in staff and management training.

How would you describe actual food production system in Albania?

Two different speed type systems in parallel exist and operate throughout the value chain of the food system in Albania. One of them, much smaller, is a group of large, modern, well-equipped and adequately managed farms, processors, suppliers and distributors that succeed in both quantity and quality to achieve competitiveness in both domestic and regional and distant markets. Unfortunately, a significantly larger group is represented by small, family, poorly equipped and poorly managed farms and a significant number of low-utilization processing entities with outdated equipment and poor management. Most of the entities in this group are low-productive, low-profit, and non-competitive.

Participants in all round tables showed awareness of the general, well-known weaknesses and limitations of the small-scale farms in Albania. These weaknesses are reflected in the following: extremely small and fragmented farms; low productivity in almost all production activities in crop and animal agriculture; low level of application of modern technologies and agrotechnical measures; traditional approach in production and management; outdated assortment in plant production and breed composition in animal agricultural production and the lack of awareness of possible negative environmental impact.

How does it compare to the regional or European food system?

Albanian agro-food industry will become part of regional and European food industry, however, in the majority of cases it still remains oriented on the Albanian consumer. Food safety and the lack of traceability of the raw materials are the major problems. The number of the enterprises in the food sector that can compete in a regional and European level are limited, to mention some of them Gjiofarma, Lufra, Klegen, Miell Tirana, KMY, EHV etc. The enterprises mentioned above, both in technology and quality, can be compared to countries in the region. They compete with the same standards as countries in the region.

Perspectives on market needs / demands

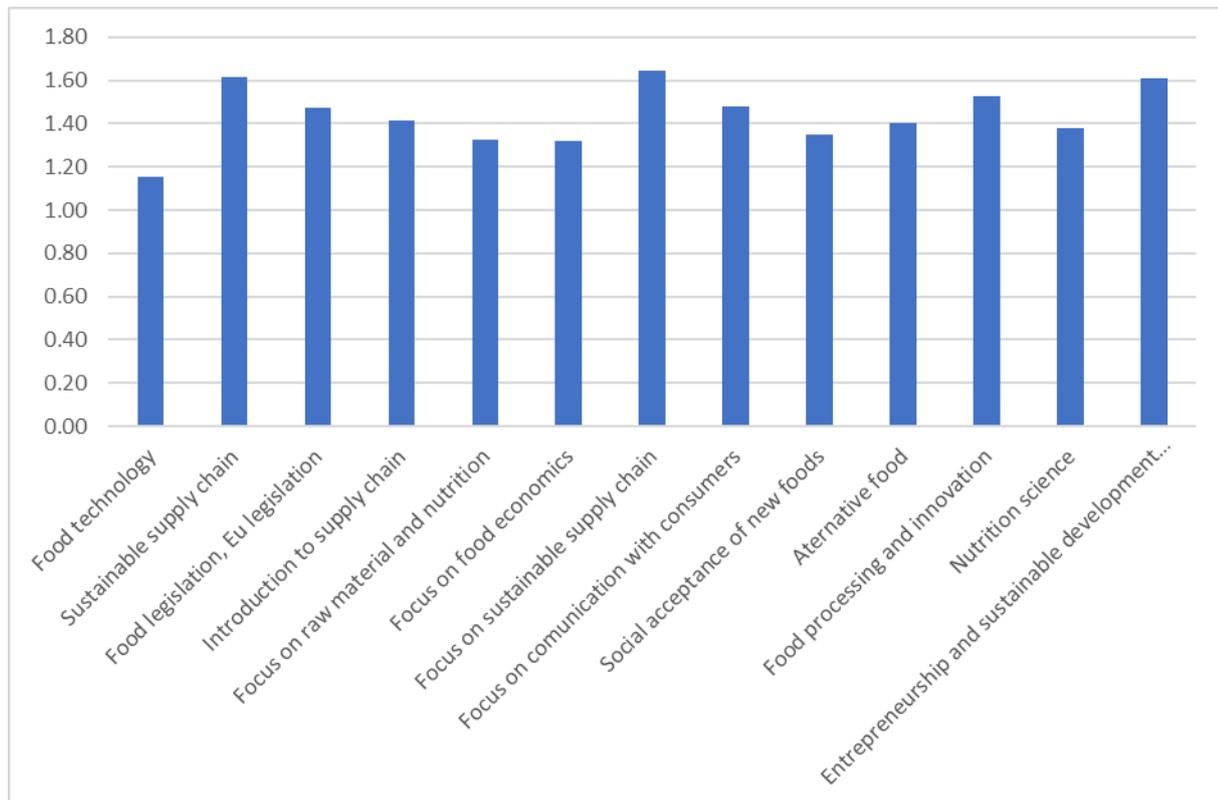
Workforce issues

- The workforce, unfortunately, is often unskilled, and incompetent so the company has to invest extra for education and training (Miell Tirana).
- The biggest challenge is to empower an employed person to apply the acquired academic knowledge in the company in a way to respond quickly to change, to solve analytically the problem, to be ready for changes posed by competition or for changes required by legislation.
- Companies think that it is very difficult to find a skilled and motivated workforce in the market,

- One of the main objections to the workforce is the lack of responsibility and an underdeveloped awareness of the position / role of agricultural production in society in general.
- Knowledge of a sustainable food production chain, from proper production, processing and distribution to the final consumer;
- Knowledge in waste management and food system impact to environment;
- Knowledge in the food safety and the implementation of quality standard.
- Knowledge in economics issues: marketing, management, and communication
- Knowledge on innovation management

From the validation of the questionnaire with the participants of the focus groups it is shown that the discrepancy between what it is known already and what it is important, identifies as the most important topics to be considered from the new MSc in sustainable food systems: Sustainable supply chain, entrepreneurship and sustainable development, Food processing and innovation, Food legislation and Eu legislation¹⁰.

Table 21: Future needed knowledge Albania



Source: UET, AUT, 2019

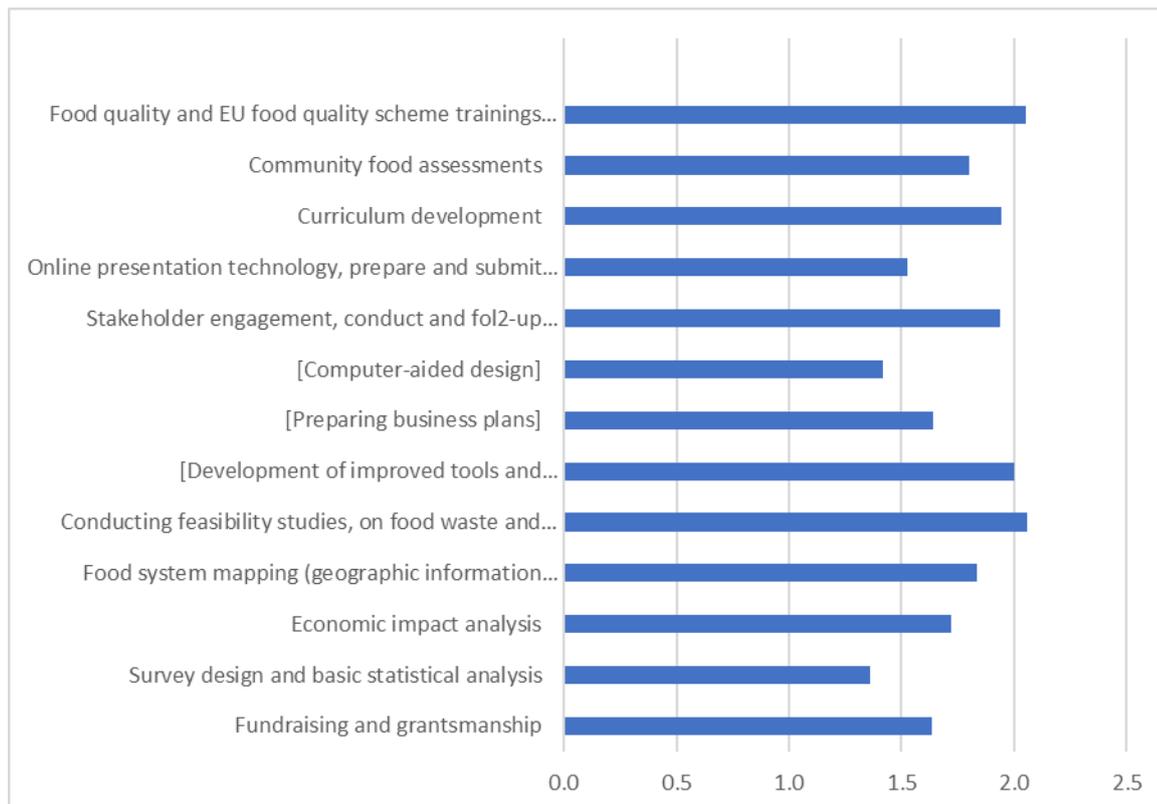
Many participants from different stakeholder emphasises motivation of workforce, together with loyalty and devotion to the enterprise/farm/company as very important element that could facilitate business success and achievement of its vision and mission (Miell Tirana).

¹⁰ Rated as a discrepancy between the level of importance and the level of the knowledge the stakeholders have

Participants in the focus groups have rated the current needed training needs, as it is shown in the Figure 31 as the most important:

- Food quality and EU food quality scheme trainings (EU legislation alignment)
- Development of improved tools and methodologies for food systems analysis
- Food system mapping (geographic information systems (GIS))
- Conducting feasibility studies, on food waste and losses on major food value chains

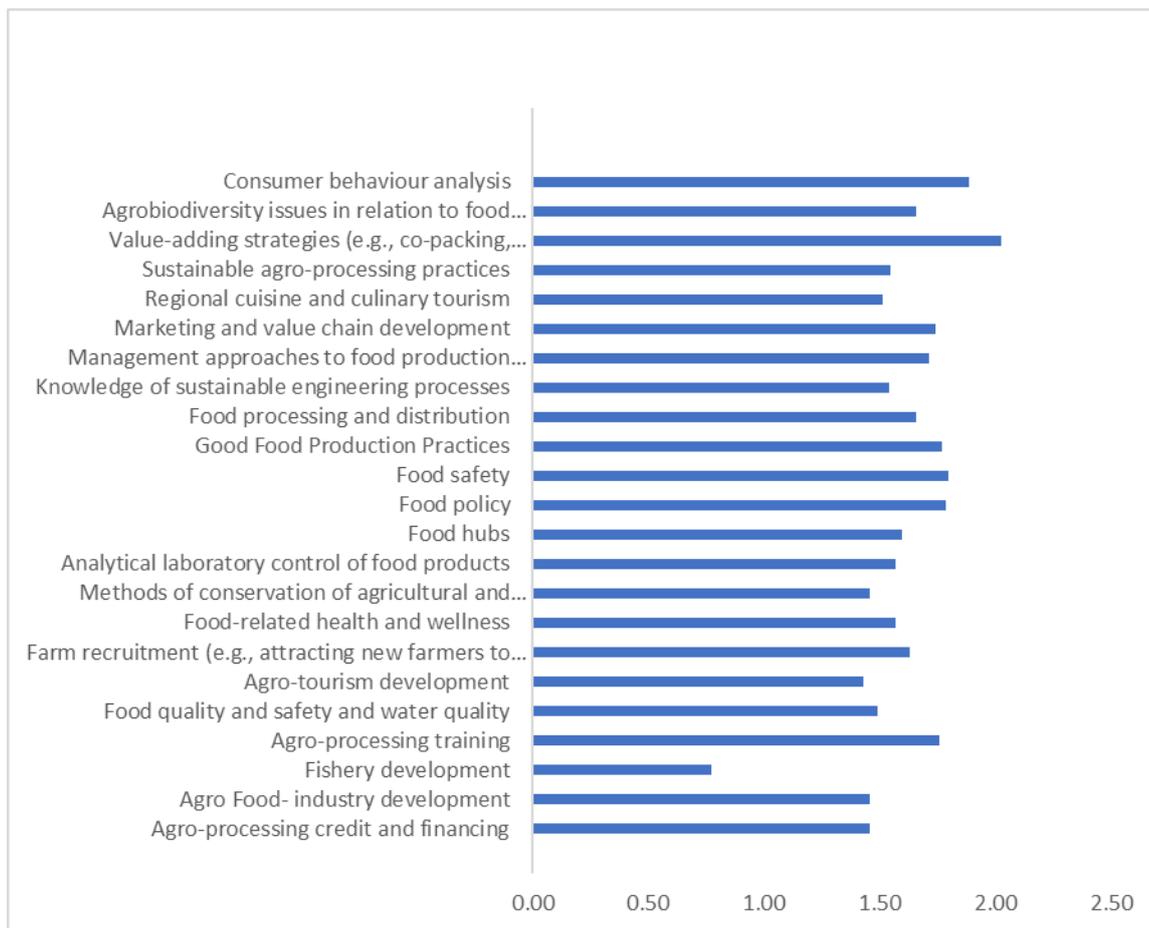
Figure 31: Further training needs



Source: UET, AUT, 2019

And finally, in the figure below are shown that the most important competences to the participants of the focus groups:

- Consumer behaviour analysis
- Value adding strategies
- Marketing and value chain development
- Management approaches to food systems
- Food safety
- Food policy
- Good food processing practices
- Agro processing training

Figure 32: Training needs (Albania)


Source: UET, AUT, 2019

Perspectives of the sector

How do you see the future of the sector?

According to the participants of the round tables/study visits, the sector is not receiving the attention of the Albanian public policy. Nevertheless, the food sector will increase in the future for many reasons. First because of the domestic growing demand and secondly because of the tourism development.

What is the role of EU Integration?

The integration into the European Union plays an important role as the opening of the negotiations is linked also with the food sector and agriculture. This process will definitely have an impact in terms of safety and quality standards which are expected to improve due to the EU accession. The accession in EU requires the provision of quality system of control, traceability, legislation approximation etcetera. The speed and success of bringing the domestic food production system closer to the European market will largely depend on the ability of the administration to lead the process. In this framework the role of academia is extremely important because universities should adapt their curricula accordingly to the new needs emerged from the EU alignment process framework.

What is the role of universities?

The role of the university and the academic community is crucial in establishing an effective sustainable food production system, through the introduction of new curricula, study programs that would empower future professionals, providing them with the knowledge and competencies identified as lacking. The role of universities does not end there, but requires their close cooperation with extension services, administration, and especially with agricultural and other public policy makers in order to help them to conduct all structural and other measures required on the path towards sustainable food production system.

All participants of the round table and study visits, stated that they have a limited cooperation with the academic community, they undertake the through students' internships. They stated that the University has to contribute more in the analysis of climate change and the adoption of autochthon varieties.

What is the role of the policy?

According to participants of the round tables/study visits, the implementation of the policies continues to be a major challenge due to lack of funds, political commitment and coordination. Hence, more support should be given to the implementation and evaluation of policies, and a shift towards stronger environmental on food systems approaches is needed.

Concluding remarks

Discussion with stakeholders during round tables resulted in numerous conclusions, the most important of which are the following:

- The idea of introducing the new MS course "Sustainable food system" is warmly welcomed by all participants, as such course is great opportunity to train future sector professionals in missing knowledge, skills and competences, under condition that it is well, interdisciplinary, designed. Also, they all agreed that such a study program should be organized at the master/MSc level and could be accessed by students from different undergraduate profiles.
- Among most important subjects/modules to be incorporated into course participants emphasized following ones:
 - ✓ Waste management, food package issues (plastic, heavy packages in relation to CO₂ emission).
 - ✓ Food policy, food law, and food regulation
 - ✓ Food process engineering, including "smart" and "environmentally friendly" design of food processing premises and technological lines
 - ✓ Economic issues such as management, marketing, planning, analysis, project planning and proposals writing.

General, important conclusion is that sustainable food system could not be observed or treated particularly, but rather holistically, i.e. that efforts on sustainability put on one or just some parts of the food chain production could be compromised if they are missed along the whole chain.

4.3.1. Focus groups/study visit data analysis Bosnia Herzegovina

Groups composition and characteristics

As the part of stakeholder's needs' assessment ten round tables were organized in Bosnia and Herzegovina, five by University of Sarajevo and five by University of Bihać. Through discussions of the project team at UNSA, it was concluded that discussion should be organized for five stakeholders' group, and that one of the stakeholder groups in the sense of the planned project activities could justifiably be a current student of agriculture and food technology. In this regard, a roundtable was planned and held with the master students of the Faculty of Agriculture and Food Sciences, University of Sarajevo. Others four round tables were organized with representatives of food processing, agribusiness, institutions and academia. The food processing round table took place on the occasion of Plum Fair in Gradačac municipality, and the rest of them in Sarajevo. The other five tables were organized by University of Bihać in three municipalities in south-western Bosnia and Herzegovina for participants belonging to different stakeholder groups.

Table 22: Information on round tables organized in Bosnia and Herzegovina

Round table	Location	Stakeholder	Number of participants		
			M	F	Total
1.	Sarajevo	Agribusiness	4	2	6
2.	Gradačac	Food processing	4	2	6
3.	Sarajevo	Institutions	2	5	7
4.	Sarajevo	Academia	3	4	7
5.	Sarajevo	Students	4	2	6
6.	Bihać	Agribusiness, Institutions	4	2	6
7.	Bihać	Administration in education, academia, students	3	3	6
8.	Bihać	NGO, administration, agribusiness	4	3	7
9.	Cazin	Agrobusiness (production, trade)	4	2	6
10.	V. Kladuša	Food processing, Cooperatives, Trade	5	2	7
Total			37	27	64

As presented in the table above, total number of participants at all ten round table discussions was 64, out of which 58% were males and 42% females. Only two groups with female majority were academia and institutions (administration).

Groups for round tables were heterogenous in terms of age, production orientation, scale and scope of production/processing encompassing all relevant actor in food chain. All participants work within the country, but lot of those coming from production, processing Food processing group consisted of five persons from production and two from management in fruit and vegetable processing, milk and meat processing industry. Agribusiness round table was attended by producers of milk, fruit, medical and aromatic herbs, distributors of animal food and commodities for plant protection and representative of agricultural producers association. Roundtable for students was held with the Master students of agriculture

and food technology of the Faculty of Agriculture and Food Sciences, University of Sarajevo. Professors from the Faculty of Agriculture and Food Sciences, researchers from the Federal Institute of Agriculture and from Federal institute of soil science participated round table organized for academia. Round table discussion for institutions was attended by representatives of Federal Ministry of agriculture, Cantonal ministry of economy, representative of one municipality administration, municipal development agency and one NGO. Participants at the round tables organized by University of Bihac were producers of milk, vegetables, fruit, bee-keepers, food processors, representatives of municipal and cantonal administrations, associations of agricultural produces, food traders, students and academia.

Round tables information analysis

At the beginning of each round table, in introductory word the moderators explained the aims of discussion to the participants. They were also informed about ethical aspect of the discussion and called to express their thoughts freely. All participants signed consent form at the closing of the discussion.

General questions on sustainable food production systems

Understanding sustainable food production systems

Most of the participant are familiar with the concept of sustainable development in general, but, when it comes to sustainable food production systems, participants mainly did not have clear idea about the concept in its full meaning. Their understanding was quite partial, referring to, for example, sustainable land use, dealing with water crisis and its use in agricultural production, waste management in food industry, strengthen of environmental aspects in agriculture, for instance organic production, linkage between primary agricultural production and food industry, or only to economic, or only environmental aspect of sustainability.

What is currently interesting/dynamic in the sector

The introduction of new, innovative products, value-added products (such as functional and organic products) is common in different areas of the food processing industry. Quality and safety remain unquestionable, but there is a shift in packaging and product presentation. Furthermore, manufacturing itself requires the implementation of increasingly demanding international standards (ISO, HACCAP, IFS, HALAL). Development of local production in order to strengthen the local community through the model from raw material to final product, development of new products with functional food characteristics and meeting ecological production standards - meeting the conditions for export to the EU market.

What changes have you noticed during the time you have worked in the industry?

The changes that have taken place in the recent decades in the food sector in Bosnia and Herzegovina are multifaceted, moving in different directions. Despite the generally poor picture of the country's sector and the many burdens and obstacles it faces, there are notable examples of manufacturers, processors, distributors, researchers and other actors in the sector proving that even under the circumstances in Bosnia and Herzegovina modernization, intensification, profitability and sustainability is possible with knowledgeable approach. Thus, new technologies, new plant varieties and animal breeds are being introduced, together with investment in equipment and technologies in order to deal with increasing production risk due to climate change.

All participants at round tables emphasized product quality as a trump card in a market competition with efforts to minimize the use of chemicals during the production process. Farmers see organic farming as a system that could ensure the sustainability of agricultural production both in terms of economy and in terms of minimizing the negative environmental implications and raising the quality and safety of food.

As for the food processing the changes could be summarised as follows:

- Technology innovation, equipment automatization, increased IT involvement;
- Increasing demand for energy that is becoming more and more expensive and is proving to be the biggest "burden for the company". Therefore, "cheaper energy" or lower energy requirements in order to reduce production costs become imperative for cost-effective production.
- The problem of waste management is becoming a major problem that requires huge financial investments, while the uneven legislation at the state level (Federation of B&H, RS and Brcko District) makes the work of companies even more difficult.
- Implementation of management systems in all segments of food production and distribution becomes more demanding and challenging;
- Increasing needs for sophisticated analysis to ensure food safety for demanding foreign markets;
- Increasing demands of retail chains (packaging, storage conditions, shelf-life)
- Market and competition require continuous progress in terms of product quality, and in this direction, companies are undergoing certain transformations in terms of meeting product quality assurance and product standardization, which requires investing in staff and management training.
- In order to meet market demand, to be in line with population diet changes and needs and to improve their market position processors are widening their assortment introducing functional food (products), products that have a direct positive impact on human health.

Over the several recent year, with the help and efforts of Ministry of Economic Relations and Foreign Trade of Bosnia and Herzegovina few bilateral agreements on meat export were signed and realized and certain number of animal food processors qualified to export to EU. Recently, Bosnia and Herzegovina got approval for egg export, as well. Together with numerous examples of individual success in terms of export to countries in the region and EU, these are examples that clearly demonstrate potential of BH food production system to significantly increase its performances, competitiveness and market position.

How would you describe actual food production system in Bosnia and Herzegovina?

Two groups of completely opposite actors in parallel exist and operate throughout the value chain of the food system in Bosnia and Herzegovina. One of them, much smaller, is a group of large, modern, well-equipped and adequately managed farms, processors, suppliers and distributors that succeed in both quantity and quality to achieve competitiveness in both domestic and regional and distant markets. Unfortunately, a significantly larger group is represented by small, family, poorly equipped and poorly managed farms and a significant number of low-utilization processing entities with outdated equipment and poor management. Most of the entities in this group are low-productive, low-profit, and non-competitive.

Participants in all round tables showed awareness of the general, well-known weaknesses and limitations of the small-scale farms in Bosnia and Herzegovina. These weaknesses are reflected in the following: extremely small and fragmented farm property; low productivity in almost all production activities in crop and animal agriculture; low level of application of modern technologies and agrotechnical measures; traditional approach in production and management; adverse educational and age structure in primary agricultural

production; outdated assortment in plant production and breed composition in animal agricultural production and the lack of awareness of possible negative environmental impact. Low volume of agricultural production causes great troubles to food industry making it either dependant on imported raw material or leaving it to operate with such low-capacity utilization that brings serious financial problems to companies.

Nowadays, low-capacity utilization is among most serious obstacles' food processors is facing with. Thus, domestic companies for agricultural products processing compete among themselves for both raw material and for consumers. Their assortment is fairly poor, with lots of semi-products, products with short shelf-life, with lack of value-added products that could bring not only financial benefit to the company but improve their competitiveness as well. Representatives of the food processing industry complains that development and improvement of a company is mainly based on the enthusiasm of the individual (owner) and not on systemic solutions and policies.

The whole sector value chain suffered enormous damages during the war in 90s, and some of war consequences have still not been overcome. Economic transition followed the war, leaving pre-war established connection between stakeholders broken, and some of them has not be re-established yet. There is no efficient neither horizontal nor vertical coordination and cooperation.

Everything mentioned above makes food production system in Bosnia and Herzegovina insufficiently developed and uncompetitive, despite many bright examples in the sector which only proves that there is still potential and possibility in the sector to progress and improve.

It has to be outlined that sustainability issues still do not get required attention along food production chain in Bosnia and Herzegovina, neither from actors conducting their business in the sector, not from policy makers.

How does it compare to the regional or European food system?

The food production system in Bosnia and Herzegovina, compared to European, is underdeveloped in every sense of the word. The utilization of natural resources is extremely low. Specialization is not a common practice in BH, but not because of intention to diversify activities, but because of tradition orientation to certain production.

Small-scale farms and companies dominate the sector, and lots of producers in primary sector are not commercial, but produce only for their own households, selling a certain amount of products on farm gate, local market or green market.

Significant natural surfaces are either untreated or not managed sustainably. Yields are significantly lower than in EU countries. Although there are sufficient natural resources, as well as favourable natural condition for various forms of food production, low productivity, poor equipment, poor technological knowledge together with inefficient management result in very low competitiveness of the sector, not only on foreign market, but on domestic as well. Traceability, as the precondition for food safety along the food production system chain is applied only within those enterprises that are already oriented to foreign market. Evident progress in introduction of quality standards and hygiene practice along the chain is encouraging, but, generally speaking, with few bright examples (berry fruit, wine, cheese, apple, plum) food production

system in Bosnia and Herzegovina is lagging behind European one, and there is a long way in front of it to overcome numerous shortcomings and approach demanding EU market.

Perspectives on market needs / demands

Workforce issues

The workforce is one of the crucial issues for each sector, and even more so for food production systems, given that it is still labour-intensive.

Although Bosnia and Herzegovina have a very high unemployment rate, that could lead to conclusion that there is sufficient available skilled labour in the market, this is not entirely true, in term of necessary competences and skills needed to transform existing sector into sustainable food system.

During the round tables, participants outlined several following remarks related to challenges related of workforce:

- There is still available qualified labour force on the market, but they are not completely trained to deal within sustainable food system, but in most cases, they need additional training.
- Over the last 5 years there has been a significant outflow of skilled labour, so that there are already problems with the shortage of younger staff. Employees are mostly in adulthood who will soon retire and the question arises of how to tackle the upcoming problem of labour shortages.
- The workforce, unfortunately, is often unskilled, disinterested and incompetent so the company has to invest extra for education and training. The biggest challenge is to empower an employed person to apply the acquired academic knowledge in the company in a way to respond quickly to change, to solve analytically the problem, to be ready for changes posed by competition or for changes required by legislation.
- Companies think that it is very difficult to find a skilled and motivated workforce in the market, even when it comes to jobs of less complexity (agro technical operations such as pruning, etc.). One of the main objections to the workforce is the lack of responsibility and an underdeveloped awareness of the position / role of agricultural production in society in general.
- Bad image of food system, together with relatively low salaries within the food chain makes system unattractive to young people, which threatens availability of qualified workforce in future.

Among competencies and skills currently lacking but required from workforce in sustainable food production systems following ones were emphasized:

- In addition to entire basic knowledge about concerned technology, the employee should demonstrate teamwork skills, and flexibility to work in team;
- flexibility in making the most appropriate decision,
- capability of maintaining given product quality in a cost-effective manner;
- Market-orientation, which requires both creativity and a good knowledge of production technology as well as economic indicators throughout the food production chain;
- Knowledge of a sustainable food production chain, from proper production, processing and distribution to the final consumer;
- Knowledge in waste management and food system impact to environment;
- Adoption of sustainable natural resource use in day-to-day economic practice;
- High level of IT knowledge and competencies;

- Capability to apply holistic approach to work, not only rigidly adhere to the learned rules, as food production is very dynamic and changes are fast and visible.
- Leadership skills are required, to be able and capable of taking responsibility and decision making.
- Knowledge in the food safety segment and the implementation food safety and quality standard. More practical experience in this segment, as well as the product marketing segment are required;
- Knowledge in economics issues: marketing, management, capability of planning and analysing, as well as competences in project cycle management.

Many participants from different stakeholder emphasises motivation of workforce, together with loyalty and devotion to the enterprise/farm/company as very important element that could facilitate business success and achievement of its vision and mission.

Perspectives of the sector

How do you see the future of the sector?

The future of food production systems in Bosnia and Herzegovina will depend significantly on whether decision-makers will finally turn to EU integration, which has been a declarative goal for years, but agrarian policy and other public policy measures have not yet made the right steps towards meeting that goal. At the moment, the sector is not a policy priority, nor is it receiving the attention it deserves. If this situation persists, major players in the sector will continue on their path to progress, while most sectors will remain left to themselves and their individual initiative. Which of these scenarios will occur is difficult to predict, but given the ongoing migration of the population

At the moment, the sector is not a policy priority, nor is it receiving the attention it deserves. If this situation persists, major players in the sector will continue on their path to progress, while most sectors will remain left to themselves and their individual initiative. Which of these scenarios will be difficult to predict, but given the constant migration of the population and the abandonment of agricultural land, unless significant changes in sector policy occur, the sector will face a rather bleak situation in the future.

What is the role of EU Integration?

EU accessioning will have an impact on BiH's food production system that is likely to be more powerful than any other economic sector in the country. Although the country is still a long way from full membership, since the Stabilization and Association Agreement entered into force, some progress can be seen in the sector. This progress is most evident among those who are the most advanced and who see their future in expanding to an advanced and demanding EU market. This progress is mainly reflected in the introduction of standard and quality control along the entire value chain. Small-scale farms and companies expect EU integration processes with hope and anxiety at the same time. Hope refers to the possibility of finding market niches for a number of traditional, quality products that are in demand in the EU market. The anxiety is a consequence of the awareness that with this volume of production and existing manufacturing practices, they cannot, or will for a long time, be able to compete in the demanding European market.

The speed and success of bringing the domestic food production system closer to the European market will largely depend on the ability of the domestic administration to lead the process. Taking into account the complex administrative structure in the country, the absence of a common agrarian policy at the state level, as well as the amount and structure of incentives within current agrarian policy measures, which has lagged

behind the CAP trends and measures for decades, the EU integration process for the agricultural sector of Bosnia and Herzegovina will be very long, complex, and significantly painful. Nevertheless, all participants agree that if there is a bright future for the food production system in BH, it is in united EU and it can only be achieved by accepting EU standards and strengthening all required competences of all actors in the sector.

What is the role of universities?

Universities play one of the key roles in food production system development and improvement. Cooperation with the academic community is good. Yet, it has to be mentioned that this cooperation is not continuous as it should be, but takes place on an ad hoc basis. All participants of the round table stated that they cooperate with the academic community through invitations to lectures, internships, engaging extras from designated departments, chemical and sensory analysis for quality control or repair. Professional excursions are organized for university students as needed.

They are mostly satisfied with the cooperation, but state that there is much room for improvement. Sometimes there is a problem that the industry goes before academic experts, which shows greater flexibility of capital compared to the work of some academic communities. All participants cooperate with faculties and institutes to the extent that various funds and projects allow them. The big producers themselves (two of them) have the will and the ability to continuously collaborate with the academic community.

The role of the university and the academic community is crucial in establishing an effective sustainable food production system, through the introduction of new curricula, study programs that would empower future professionals, providing them with the knowledge and competencies identified as lacking. The role of universities does not end there, but requires their close cooperation with advisory services, administration, and especially with agricultural and other public policy makers in order to help them to conduct all structural and other measures required on the path towards sustainable food production system.

What is the role of the policy?

Agrarian and other public policies play a key role in the efforts of the food sector to make the best use of its potential and thus contribute to overall economic progress while respecting all sustainability principles. Unfortunately, first of all agrarian policy, fails to respond to its role. All participants in the round table discussions, including representatives of the institutions, agree that the current agricultural policy in Bosnia and Herzegovina has not been designed, planned or implemented in a way that would lead the sector towards progress. Support measures are more social than developmental, very often non-transparent and do not produce the desired and expected results. Although there are strategic, developmental and legal documents in Bosnia and Herzegovina that treat sustainable approach to overall and sector development, their principles are in no way incorporated into agrarian policy measures or in any way the current sector policy priority. This especially refers to land policy.

Concluding remarks

Discussion with stakeholders during round tables resulted in numerous conclusions, the most important of which are the following:

- The idea of introducing the new MS course "Sustainable food system" is warmly welcomed by all participants, as such course is great opportunity to train future sector professionals in missing knowledge, skills and competences, under condition that it is well, interdisciplinary, designed. Also,

they all agreed that such a study program should be organized at the master/MSc level and could be accessed by students from different undergraduate profiles.

- Among most important subjects/modules to be incorporated into course participants emphasized following ones:

- ✓ Soil and water management in agriculture;
- ✓ Waste management, food package issues (plastic, heavy packages in relation to CO₂ emission).
- ✓ Food policy, food law, and food regulation
- ✓ Food process engineering, including "smart" and "environmentally friendly" design of food processing premises and technological lines
- ✓ Economic issues such as management, marketing, planning, analysis, project planning and proposals writing.

General, important conclusion is that sustainable food system could not be observed or treated particularly, but rather holistically, i.e. that efforts on sustainability put on one or just some parts of the food chain production could be compromised if they are missed along the whole chain.

4.3.1. Focus groups/study visit data analysis Kosovo

For Kosovo, there were 11 site visits conducted. It should be noted that the reason behind choosing to conduct site visits rather than organize roundtables has to do with the fact that it was impossible to organize such events during the summer. Despite numerous attempts from Universum College representatives to organize such events, they were cancelled due to inadequate number of participants. Details on the visited companies are given in the table below:

Site visit	Location	Stakeholder	Number of participants		
			M	F	Total
1.	Ferizaj	Agriculture and Food Processing	2	0	2
2.	Ferizaj	Food processing/Dairy Industry	2	0	2
3.	Ferizaj	Food processing	2	0	2
4.	Prishtina	Meat Processing	2	0	2
5.	Suhareka	Food Processing/Beverages	2	0	2
6.	Istog	Agribusiness	2	1	3
7.	Peja	Food Processing	2	0	2
8.	Istog	Food Processing/ Dairy Industry	2	0	2
9.	Prishtina	Agrobusiness (blueberry cultivation and processing)	2	1	3
10.	Peja	Meat processing	2	0	2
11.	Istog	Agrobusiness, Medicinal Herbs	1	1	2
Total			21	3	24

✓What is interesting / dynamic about this sector at the moment and what changes have been noticed during the time you have worked in the industry

When asked about key developments, the majority of companies were quick to mention the leap forward they have made in a short period of time. For example, the owner of Natyra – G stated that *“The factory started in 2015, initially producing only one type of cheese. Today, only 4 years later the company produces 4 types of cheese, yogurt and buttermilk.”* Swiss Foods International is another company that was established four years ago, and its manager also emphasized the growth of the company in a short period of time. He is especially happy with the number of new contracts they were able to secure, while at the same time preserving the quality of the products. On the other hand, the manager of Intervali company stated that its key achievements have been penetrating international markets. For their success many companies cite their courage to invest, and their patience in allowing longer time periods for investment returns. For example, at the company "Koal Seeds" say that they are always open to joint investing in the production of new seeds, which are more sustainable and more trusted by farmers.

As it is the case with the majority of businesses in Kosovo, the companies that were visited were quick to mention their challenges of operating here. Swiss Foods International mentions unfair competition, brand recognition, and lack of adequate market research/data as one of their main challenges they faced in the beginning. Intervali states that in the beginning its company had major issues with market segmentation as well as distribution, while today they see qualified workforce and political stability as their major challenge. In general, all companies listed similar key achievements and challenges, and this is a result of their similar characteristics. Increasing the number of products, market penetration, and brand recognition are seen as the major achievements for all the companies. On the other hand, they were also quick to mention political stability, lack of support from the government, difficulty in finding buyers as the key challenges they faced in the beginning. Today, they struggle with qualified employees as well as financial resources in order to increase production. Universum College found out that despite numerous international organizations involved in supporting local businesses, these companies more often than not do not qualify for financial support.

What skills are needed for workforce in this sector? Is there sufficient qualified workforce for the needs of your company?

When asked about the availability of skilled workforce in the sector and challenges in hiring qualified employees, all of the companies stated that they hire individuals through a public announcement. The way these companies announce job offerings differs depending on the position. In case the recruitment is intended for local/seasonal employees, the announcement is made on their website and local radio. However, if the plan is to recruit mid-level or senior-level management, the announcement is made in national radios, job portals, website, social media, etc. All of the companies stated that sometimes they recruit staff based on recommendations, and in most cases these recruitments prove to be successful. None of the companies contact professional high schools or higher education institutions for recruitment. This is an opportunity for STEPS to develop a program that aims at strengthening the relationship between academia and the business community.

Despite having an adequate education, companies state that employees more often than not lack the practical skills which are required in the workplace. Therefore, they spend the first 3-6 months training their employees. Unanimously, the companies need food technologist and in case there are individuals with these qualifications, they will be hired immediately.

Do you collaborate with academia?

As mentioned previously, the majority of companies do not have a strong relationship with the academia. In some cases, they have a relationship with local professional high schools, where teachers organize study visits and sometimes short-term internships, however, the relationship does not go further. When asked about the mode of collaboration that could be useful for them, the companies stated they would like to see students assist them academically. The proposed set of collaboration modes is given below:

- Study visits with the intention of learning about different practices.
- Internship that lasts longer than 3 months.
- Students conducting research for the company
- Experiential learning.
- Recruitment
- Promotion.

Who are your main suppliers? Where do they come from?

Due to the type of products these companies produce, it is very important for them to have a strong relationship with the suppliers. Because it is integrated vertically, Bibaj Group has limited suppliers and works with local grain providers when they have low yield year or have a spike in their demand. Natyra G secures the milk from local farmers and Devolli Corporation subsidiary Vita. Almost the same situation exists for Intervali Llc. Where their main supplier is Devolli Corporation subsidiary M&Silloso. In addition to receiving the raw material from this company, they also import 100% of the palm oil from India. RCompany has a variety of suppliers. They import cucumbers and peppers from local farmers, as well as from suppliers in Macedonia, Albania, Greece and Turkey. The suppliers may change depending on the season and the prices offered by them. Moreover, RCompany imports the glass jars from The Republic of China. Swiss Foods International suppliers differ depending on the season. The majority of meat is imported from Brazil and Turkey, while in rare cases they company purchases its raw material from local meat producers. Companies emphasized their satisfaction with their suppliers, however, that import the raw material stressed the need for lower customs tax. On the other hand, 3 companies that are supplied primarily locally seem to have a strong relationship with the suppliers and they wish to continue cooperating for a long time.

What are your needs for equipment, machineries, laboratories?

Based on the site visit, it is important to emphasize that companies have different quality of equipment and laboratories, which may be a reflection of their experience as well as the success of their organization. For example, Bibaj Group has a relatively new set of equipment purchased in Slovenia. It is their understanding that the quality of their equipment and laboratory are directly responsible of the quality of their products as well. Intervali Llc. that primarily produces sweets and wafer biscuits purchased their equipment less than seven years ago in Turkey. Natyra-G recently purchased all of their equipment in Germany and Holland. They live under the assumption that German and Dutch products are more reliable and thus far they are very satisfied with the quality. Swiss Foods International is the youngest company, and they have purchased new equipment as well. According to the manager, they plan to make some improvements due to the increase in demand and also the new line of products they have started. Lastly, RCompany, the most senior out of five underwent a radical transformation by purchasing a new building and equipment. The company purchased the majority of their equipment in Turkey, China, and Germany.

In general, companies are satisfied with the state of their facilities, however, they admit that investing in new technology is costly and sometimes it does not justify the means. They stress the importance of customs tax as a challenge and appeal to the government to provide subsidies to local producers. On the other hand, it is worth highlighting that the government reduced or removed custom tax for the majority of equipment used for production, however, this does not apply to all sectors and equipment.

What is the Legal and Economic Framework for your sector?

Because the legal and economic framework in Kosovo was almost entirely destroyed in 1999, producers continue to face challenges that are not common for a country located in Europe. Problems range from infrastructure, which include access to the electricity grid, water supply, roads etc. To access the electricity grid, each company has to make a large investment which is a major barrier to entry and interferes with growth. Moreover, businesses pay a higher fee for electricity, which is very discouraging. The same situation is applicable for other utilities as well. These challenges were continuously mentioned by all companies.

The representative from Natyra G stated that *“The Ministry of Agriculture should create more efficient subsidy management mechanisms for small farmers. Because of the lack of access to these opportunities, the quality of milk they provide cannot reach grade A. This class enables us to produce products of higher quality and to be more competitive in the European market.”* This is the case with many small businesses who were established by local farmers, and who rely on government subsidies for support. Such challenges make the production process very volatile and it is one of the reasons why these companies are unable to enter into long-term contractual agreements with big retailers in Kosovo. Nevertheless, all of the companies agree that removing the custom tax for imported machinery has been very welcoming and allowed them to modernize their infrastructure. They unanimously agreed that the government should undertake adequate measurements that protect local producers from unfair competition, especially from neighbouring country companies whose products are heavily subsidized by their governments and could be sold at a lower price in Kosovo.

In conclusion, all companies have been able to achieve success in short period of time. This is due to the fact that Kosovo has a large trade deficit and it is relatively easier to establish a company that substitutes imported goods. Nevertheless, the legal and economic infrastructure continues to pose challenges for local producers, therefore, there is an urgent need to strengthen and deepen the relationship between the government, business community and academic institutions. Because of their growth, companies are not struggling to find skilled workers that have adequate degrees in order to process machinery, develop new products, and grow the business from a marketing perspective. When informed about the goal of STEPS, they applauded the initiative and asked to be involved in further development of the program.

5. Conclusions and recommendation

The need assessment process has shown that the three countries have similarities in rural and agriculture sector not only in their development perspectives but also in their current and future skills and competences needs. Regarding the characteristics of agriculture and food sector development, two type development speed is observed. From one side, family-poorly equipped and poorly managed farms and a significant number of low-utilization processing entities with outdated equipment and poor management. Most of the entities in this group are low-productive, low-profit, and non-competitive. From the other side, a group of large, modern, well-equipped and adequately managed farms, processors, suppliers and distributors that

succeed in both quantity and quality to achieve competitiveness in both domestic and regional and distant markets. Unfortunately, this group is represented by small number of value chain actors.

In both countries the EU integration is perceived as one of the main factors which plays an important role in rising the awareness of institutions, business operators and consumers on food quality and safety standards. The EU integration process will also increase the level of awareness on food sustainability issues. EU integration, has also an important role in the capacity building process, as previously mentioned, the lack of competences and knowledges in all the sectors dealing with food systems, will require a more qualified and responsible labour force. As a consequence, this will also have an impact on the quality of the products.

In both countries the following are observed:

1. Weak enforcement of the food safety and environmental legislation;
2. Lack of knowledge on sustainability and the links with the food systems in Albania
3. Lack of enforcement and compliance with standards on slaughtering (hygiene, animal welfare and waste treatment/poor management of municipal slaughterhouses); outdated technologies and production facilities;
4. Poor waste disposal and treatment practices/facilities and technologies and low by-product utilisation. Inadequate animal health management /Prevalence of some animal diseases;
5. Inadequate manure handling practices;
6. Small scale farming, lack of adequate facilities, specialised vehicles and laboratory equipment
7. Processing - inadequate technologies and equipment (especially cheese production); lack of qualified labour (milk processing technology, laboratory, etc.) in rural areas
8. Weak links among actors in the value chain, especially between farmers and processors (milk collection systems);
9. Ageing farm population and lack of interest and motivation of youth to consider farming as a main occupation;
10. Insufficient knowledge, information and skills on modern farm management, national and EU standards; weak compliance with standards;
11. Limited vocational training capacity and insufficient range and quality of specialised advisory services;
12. Missing skills in food safety management systems, equipment, laboratories, and as well as knowledge and skills of the labour force in management, entrepreneurial and marketing issues
13. Insufficient knowledge, information and skills on national and EU standards; weak compliance with the standards;
14. Missing or weak food safety management systems, equipment, laboratories, and as well as knowledge and skills of the labour force in this direction;
15. Lack of producers' knowledge of quality requirements and specifications of raw vegetables for food industry /Production does not comply with global GAP/ no body accredited to certify farms at reasonable costs;
16. Poor technological expertise in informal and small wineries;
17. Lack of knowledge of brands and trademarks and their protection;

Regarding the actual and future needs the stakeholders stresses the following needs on: focus on sustainable supply chain, food processing and innovation, entrepreneurship and sustainable development, food legislation and EU legislation, development of improved tools and methodologies for food system analysis, food system mapping, conducting a feasibility study on food waste and losses on major food value

chains. Other competences evoked are the consumer behaviour analysis, good food processing practices, food safety, food policy, management approaches to food systems etcetera.

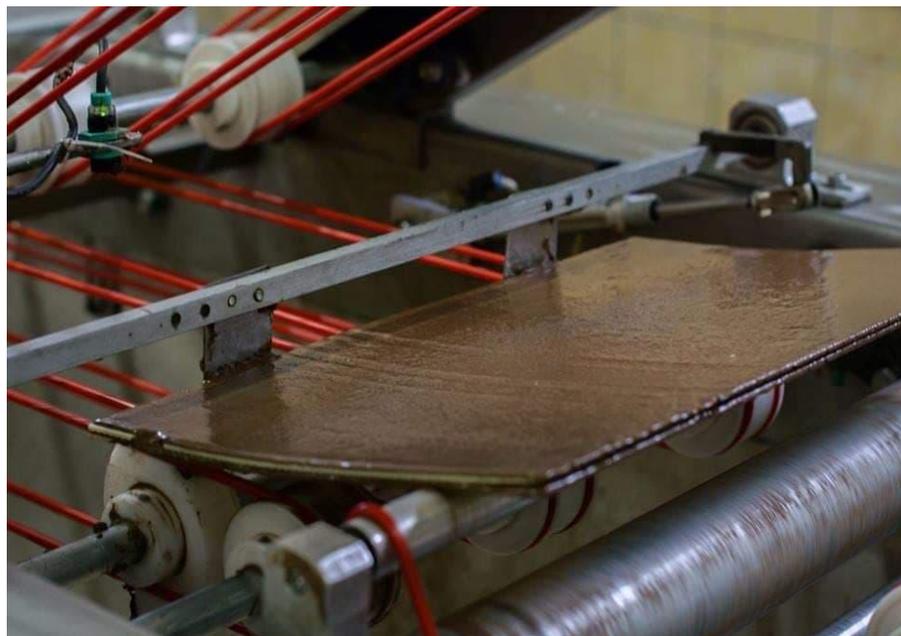
In the case of Kosovo, in regard to human resources, capacity building for quality assurance should be a top priority of business and public sectors. Companies should consider financing the studies and offering scholarships for students oriented towards food technology, agriculture, and agribusiness. The reservation wage of Kosovo youth is relatively high, mainly due to family members working in the EU and high remittances, causing young people to refuse certain jobs and study fields. Therefore, this should be considered as an important factor in policy making. A change in the mindset of the people is necessary. Considering the high percentage of arable land in Kosovo, agriculture shouldn't be seen as the last option, but rather as a profitable and promising one. The companies see the need for more study programs related to food technology and agribusiness.

While in a policy aspect, the issues raised by the interviewees are that national policies should primarily focus on fulfilling country needs before focusing towards export. In this regard, reliability of domestic products should be increased. Secondly, niche markets for cultures that can be cultivated in Kosovo should be sought in the European Union. Productivity should increase and a reorientation of sectors is necessary, focusing on those cultures that bring competitive advantages for Kosovo. And finally, hydro sanitary border controls for inputs should improve and so should the laboratory institutions. Undoubtedly, the necessary skills for taking such actions and leading such processes in Kosovo need to further be developed, and a master level study program in sustainable food production system would prove useful in this regard.

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ANNEX A. Pictures from site visits Kosovo



































ANNEX B. Pictures from site visits Albania

Photo 1: Study visit meat sector KMY



Source: AUT, UET, 2019

Photo 2: Study visit dairy sector Mozzarella Italia



Source: AUT, UET

Photo 3: Study visit olive oil sector



Source: AUT, UET

Photo 4: Study visit flour sector Miell Tirana



Source: AUT, UET, 2019

Photo 5: Study visit Slaughterhouse Biofaz



Source: AUT, UET, 2019

ANNEX C. Pictures from site visits Bosnia Herzegovina

