TECHNOLOGICAL CHANGES AND SKILLS NEEDS IN THE AGRI-FOOD SECTOR IN KOSOVO*: BIOCHEMICAL AND MICROBIAL PRODUCTS

SUMMARY REPORT

CONTENTS

INTRODUCTION

This summary report[1] forms part of a broader study on the technological changes and skills needs of the Western Balkan agri-food sector, conducted by the European Training Foundation (ETF). The aim of this summary report is to examine the potential of biochemical and microbial products in Kosovo from the perspective of skills supply and demand.

The study aims to inform a foresight exercise on technological changes and skills needs in the biochemical and microbial products sector in Kosovo[2]. The purpose of the foresight exercise is to identify concrete skills related measures to support the accelerated development of the sector in preparation for the single market.

OVERVIEW

Biochemical and microbial products have the potential to revolutionise the way we cultivate crops, process raw products into foods and beverages and address the challenges of food quality, safety, preservation and environmental sustainability. The application of biochemistry in agri-food globally is still in its infancy. Its full potential to unlock a greener, more efficient future for agri-food value chains has not yet been reached.

Agricultural biochemistry and microbiology are branches of science that investigate the chemical reactions that take place within plants, animals and microorganisms involved in agriculture, and study different microorganisms. Advancements in these areas have paved the way, for instance, for precision agriculture, which utilises data analysis and biochemistry principles to optimise farming practices. Other important products for agri-food include natural agents to maximise soil fertility and crop yields, products to extend the shelf life of fresh produce, and biofertilisers and biostimulants that promote environmentally-friendly farming. Moreover, with increasing energy demands and the imperative to reduce greenhouse gas emissions, biochemical products such as energy crops and microbial systems are being developed to efficiently convert biomass into renewable fuels.

The area of biochemical and microbial products in the agri-food industry includes the manufacturing of fertilisers, nitrogen compounds, pesticides and other agrochemical products, as well as research and experimental development in biotechnology. These sectors are classified under NACE codes, as follows:

- manufacture of fertilisers and nitrogen compounds (C20.1.5);
- manufacture of pesticides and other agrochemical products (C20.2);

---

[1] This report was prepared by Pirita Vuorinen, ETF. The contents of this summary report are the sole responsibility of the ETF and do not necessarily reflect the views of the EU institutions.

[2] * This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence - hereinafter 'Kosovo'.

- research and experimental development of biotechnology (M72.1.1).

The biochemical products sector in the agri-food industry in Kosovo is in its early stage of development and a few SMEs are currently operating in the sub-sector. Although Kosovo has the capacity to produce fertilisers and nitrogen compounds, and to manufacture pesticides and other agrochemical products, the market for companies operating in these sectors in Kosovo is highly unstable.

According to the 'Manufacturing Industry 2021' report, there were five companies manufacturing organic basic chemicals in Kosovo in 2020, which employed a total of 24 people. This is an increase from 2019, when there were only three companies with nine employees. There was a similar fluctuation in the manufacture of fertilisers and nitrogen compounds sector, with one company operating in the sector in 2019, down from four in 2018.

Furthermore, in 2020 there were two companies operating under the manufacture of pesticides and other agrochemical products (C20.2) NACE.[3] This is a significant drop from the 23 enterprises in 2019, which employed 120 workers.[4] The stark decrease may be due to the impact of the COVID-19 pandemic.

TABLE 1. NUMBER OF ENTERPRISES, EMPLOYMENT OF THE SUB-SECTOR C

Manufacture of organic basic chemicals	**2018**	**2019**	**2020**
Number of companies	4	3	5
Number of employees	23	9	24
Manufacture of fertilisers and nitrogen compounds			
Number of companies	4	1	3
Number of employees	4	3	7

Source: data gathered from the Ministry of Industry, Entrepreneurship and Trade (2020). Manufacturing Industry Report (Sector C). Available here.

There is no statistical information available in Kosovo for the research and experimental development of biotechnology (M72.1.1) sector. This reflects the small size of the market in Kosovo as well as the early phase of the sub-sector. However, we identified and interviewed two innovators in the area, with one of their activities falling under NACE M72.1.1.

SKILLS DEMAND

Based on the ESCO classification, the following occupational profiles match the skills and knowledge expressed by interviewed companies:[5]

[3] Data gathered from the Ministry of Industry, Entrepreneurship and Trade (2020). Manufacturing Industry Report (Sector C). Available here. p. 88.

[4] Data gathered from the Ministry of Industry, Entrepreneurship and Trade (2020). Manufacturing Industry Report (Sector C). Available here. p. 88.

[5] Based on the ESCO classification of skills, competences and occupations. Available here.

- 2131.4.2 – biochemist
- 2131.5 - food biotechnologist
- 2145.1.4 - food technologist
- 2131.3 - bioinformatics scientist
- 2132.1 - agricultural scientist
- 2132.2 - agronomist
- 2133.11 - soil scientist

SKILLS SUPPLY

The skills supply for the development of biochemical and microbial products for agri-food in Kosovo is underdeveloped. The VET and higher education provision in the fields of agriculture, food technology and biotechnology are very general. No career guidance systems have been developed in the country that would help address the gaps in the area. Furthermore, there are no specialised CVET courses for biology and food technology skills profiles. Companies receive no outside support for training their employees. Interviewed companies emphasised the need to provide their employees with comprehensive on-the-job training in order for them to be able to work.

Overall, equipping students with more specific skills remains a challenge, even though the universities seem to train graduates that the labour market can absorb. There is just one university (the University of Prishtina, UP) in Kosovo that teaches food technology with biotechnology at undergraduate level. It has approximately 251 graduates per year. UP also has a graduate course in the field of food science which produces approximately 43 graduates per year. In addition, the UP is the only education institution in Kosovo providing undergraduate and graduate studies in chemistry and chemometrics. According to the data found on the University's website, there are around 120 undergraduate students and 45 graduate students enrolled each year.

In general, Kosovo's skills demand and supply in the biochemical and microbial product sub-sectors are mismatched and disbalanced. Only two micro-companies have been identified as working in this field, with only two to three employees in each of these.

Moreover, no business intermediaries working to develop or support the area specifically were identified, although ICK, the business intermediary that helps companies in the digitalisation area, is also known to support companies in the area of biochemical and microbial products through its business incubator. The production of innovative biochemical and microbial products has also not been recognised by the authorities as an investment area.