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TECHNOLOGICAL CHANGES AND SKILLS NEEDS IN THE AGRI FOOD SECTOR IN ALBANIA: DIGITALISATION FOR AGRI-FOOD

Summary report

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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 digitalisation for agri-food in Albania from the perspective of skills supply and demand.

The study aims to inform a foresight exercise on technological changes and skills needs in the digitalisation for agri-food sector in Albania. 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.

[1] This report was prepared by Pirita Vuorinen, ETF.

Overview

Digital technologies improve various aspects of the agri-food production, in particular its efficiency, productivity and ensuing economic viability. Digitalisation of agri-food is a developing niche in the context of the agri-food sector, with technologies such as drones, e-commerce, crop pattern monitoring and robotics becoming more prominent worldwide.

The analysis of digitalisation for the agri-food sector focuses on the businesses developing and producing the digital innovations for agri-food under the following NACE sectors:

- Manufacture of agricultural and forestry machinery (C28.3);
- Manufacture of machinery for food, beverage and tobacco processing (C28.9.3);
- Computer programming, consultancy and related activities (J62);
- Information service activities (J63);
- Research and experimental development on natural sciences and engineering (M72.1).

Albania lacks producers of digital technology for agri-food, so most analyses focus on stakeholders which apply digital technologies in agri-food production.

In 2021, there were 4 005 companies operating in the ICT sector, amounting to around 3.4% of the total number of companies[2]. Around 85% of companies operating in ICT had less than five employees. Companies were mainly involved in activities relating to web development, search engine optimisation (SEO), e-commerce development, app mobile development, advertising, and branding. Unfortunately, there is a lack of information regarding the involvement of these companies in the agri-food sector. As a result, the analysis focused on stakeholders that apply digital technologies in agri-food production, instead of developing or producing them. Some of the most prominent digital technologies in Albania's agri-food ecosystem are technologies in marketing and sales, such as e-commerce, other types of online platforms that connect agri-food producers and consumers, and the development of broadband internet connections.

[2] INSTAT, 2021. Business Registers. p. 13. Available here.

Skills demand

The companies interviewed emphasised the increasing demand for skill in areas where agriculture, digitalisation and technological development are converging. Specifically, specialist ICT skills in social and digital media, and skills to implement innovative technologies such as the Internet of Things (IoT) are in demand. In addition, technical skills profiles, complemented by knowledge relating to marketing, human resources (HR) and business development are also in demand.

Skills in the ICT sector are some of the most demanded skills in Albania. The stakeholders interviewed provided a rather long list of ICT-related skills as increasingly important in the agri-food value chain – most of them requiring a combination of specialist qualifications in ICT and knowledge of the agri-food sector specificities. For example, besides the broad skills of software development, stakeholders mentioned:

- skills and knowledge in smart technologies on farms mainly relating to sensing technologies and precision agriculture;
- general skills in agronomy and/or food technology;
- specialised skills in agronomy and agriculture, such as the ability to document organoleptic analyses and physico-chemical and microbiological analyses for patterning raw materials in food processing;
- applied knowledge on new technologies and methods for implementing innovative systems in agriculture relating to the practices of plant cultivation / animal breeding, fertilisation, irrigation and spraying;
- skills in operating and understanding of laboratory measuring instruments and those used in food processing equipment.

The companies interviewed emphasised the need for profiles combining specialist digital skills with agri-food sector specific knowledge. Such occupational profiles and skills, at the intersection of ICT and agriculture, are not yet described in the ESCO skills and occupation database.

Table 1. Relevant Technical occupations identified by companies

Digital technologies	
2512 - software developers 2511.3 - data analyst 2511.4 - data scientist 2514.3 - industrial mobile devices software developer 2514.2.1 - embedded systems software developer 2529.3 - embedded systems security engineer	3111.13 - remote sensing technician 3114.1.10 - sensor engineering technician 3115.1.11 - mechatronics engineering technician 8211.3 - mechatronics assembler 8211.5 - motor vehicle assembler 8212.3 - electronic equipment assembler
Agronomy, agriculture and food processing	
2132.1 - agricultural scientist 2132.2 - agronomist	3142.1 - agricultural technician 2145.1.4 - food technologist

The occupations for which there is a growing demand require different skill levels. For instance, mechatronics engineers, sensor engineering technicians and embedded systems software developers require at least ISCED[3] level 5. The highest level of qualification is required for agronomist and food technologist (ISCED 6 level) and mechatronic engineer (ISCED 7 level).

[3] International Standard Classification of Education, ISCED.

In terms of business services and related occupations, company interviews reveal the importance of skills in marketing management, accounting and legal services.

Table 3. relevant BUSINESS support OCCUPATIONS identified by COMPANIES

Business support occupations	
1212.2 - human resources manager 1219.6 - project manager 1213.5 - business manager	2411.1 – accountant 2619.7 - legal consultant 3313.1 - accounting assistant 4416.1 - human resources assistant

The companies interviewed emphasised that employees with creativity in building business relations (e.g. networking) and economists are the easiest profiles to find in the market. By contrast, they named agronomists with an in-depth market knowledge as the least available occupational profile, meaning that people with such experience are the hardest to find in the market.

Finally, the companies also stressed the importance of some of the non-technical or soft skills. These primarily included the willingness to continue professional training, adaptation to company life, as well as flexibility and dynamism regarding new business initiatives. They also emphasised that these skills are very hard to find.

Skills supply

Vocational education and training

Vocational secondary education relevant for the digitalisation for the agri-food niche in Albania is limited, although nine VET institutions and secondary schools across Albania offer different courses relating to agri-food and information and communication technology (ICT). The training offer is geared towards equipping students with sector-specific skills, but they lack the multidisciplinary character sought by employers. The specific needs of the niche, such as combining digital skills with education in food technology and agronomy, are not addressed by such training. Therefore, educational institutions, such as secondary schools, increasingly cooperate with agricultural businesses to equip students with various skills, including ICT. Such programmes seem to be ad hoc since Albania has not yet introduced a dual system of education.

Continuing vocational education and training (CVET) provision largely focuses on providing skills for using digital technologies, and not the development of technologies such as the National Employment Service's training developed building on the EU's Digital Competence Framework 2.0.

The companies interviewed argued that, in terms of skills supply, trained specialists in Albania had the necessary skills to participate in the agri-food sector, but they also needed at least 12 months of additional training to develop appropriate practical skills for the workplace relating to the use or adoption of digital technologies. To address those gaps, the companies interviewed (micro and small) developed their own training sessions to train their employees in the fields of technologies of cultivation and innovation in agriculture; user IT skills; HR management; knowledge of the fruit and vegetable market; sales; risk analysis; and credit analysis. Such training generally took place at the company and were tailored to the specific needs of the company. Interviewees also outsourced certain training activities and emphasised cooperation with the Banks' Association, the JICA (Japan International Cooperation Agency), ADGF (Albanian Development Guarantee Foundation), Rabobank, AMF (Financial Oversight Authority) and other foreign programmes operating in Albania. No evidence on cooperation with trade unions was found.

Intermediary organisations

The goal to meet the challenges of competitiveness, digitalisation and sustainability poses many challenges to the primarily micro and small agri-food companies. Business intermediary bodies are critical for providing access to relevant and timely informal and non-formal training to agri-food companies who generally find having relevant skills to perform far more important than training recognition. Intermediary organisations have an important role in creating value in a fragmented context, by connecting agri-food companies with organisations and networks with which they can collaborate, co-create, troubleshoot, or co-innovate with. Their role is particularly heightened in agri-food where agriculture, digitalisation and technological development converge.

The support services of intermediary organisations focus generally on the application and not on the development of digitalisation solutions for agri-food in Albania. The intermediary organisations interviewed emphasised their support to agri-food SMEs in terms of provision of information, training, counselling, coaching, mentoring, networking and project implementation. Some also provide online training in digital skills, with digital marketing being one of the targeted areas.

Although important, the public advisory bodies play a relatively small role in providing support and technical assistance to off-farm subsectors (i.e. processors, wholesalers and retailers) due to limited financial and human resources. The Ministry of Agriculture and Regional Development emphasises[4]

[4] MARD (2021). MAP Sector Study. Available here.

that agricultural specialists, as well as support agents who serve in the public sector, have an average age of over 55 years. Many lack IT skills and an adequate understanding of new technologies and how these can be applied to agri-food, thus reducing the quality of public support offered to the agri-food producers. This suggests that their operations are functionally limited to more urbanised and technologically advanced areas of the country. Their activities do not adequately address the development of technical skills and improve the generally lower education rates in the rural areas.

Box 1. Examples of intermediary organisations' support

SME Albania runs a 6 day summer academy for SMEs to tackle increased competition, regulatory challenges and branching out to embrace new market segments. An interesting development is a new project the SME Albania is preparing in close collaboration with the Department of Agribusiness of the University of Korçë, and with the Faculty of Economics and Agribusiness of the Agricultural University of Tirana, to build capacity and train young people on sensorial technologies on apple farms in the Korçë region.

The **Regional Agencies of Agricultural Extension (RAAE)**, as per Regulation No 147 of 13 March 2018 on the establishment, organisation and functioning of the Regional Agencies of Agricultural Extension, aim to contribute to the development of a competitive and sustainable agricultural sector while building long term partnerships with beneficiaries. The extensions are located in in the regions of Shkodër, Tirane, Lushnje, and Korce, Their main duties and responsibilities consist in providing extension services to advance technical and technological development of agricultural farms, advising farmers on utilising national financial supporting instruments, promoting farmers' cooperation, providing information on the environment, product quality, marketing, and organic agriculture standards, participating in the development and implementation of agricultural development programmes, collecting statistical data, etc.

Agricultural Technology Transfer Centres (ATTC) are located in the regions of Fush, Kruja, Korca, Vlora, Lushnja and Shkodra. Their aim is to support farming activities and the agri-food sector in general. The centres are responsible for conducting applied research in various fields of agriculture. In addition, they support the Ministry of Agriculture and Regional Development in strategy formulation and the design of national schemes and strategies, facilitate technology transfer to agriculture and food-processing businesses, and even supply high-certificated generation materials for some types of seeds and seedlings.

The Association for the Development of Agriculture in the Mountain Districts (ADAD) has 750 members, spread over 30 groups of producers according to agricultural activities and territories, in the mountain regions of Kukës, Dibër, Korçë and Shkodër. The association provides technical assistance and procures inputs to agricultural producers.

Higher education and research

Universities play a fundamental role in fostering the digital transformation of the agri-food sector. They have a role in teaching, but also in carrying out research in the agri-food sector. Their research departments play a key role in innovation.

There are nine universities in Albania that offer 19 programmes in ICT and software management. Relevant new courses offered include information management for agro-businesses, business informatics, management of information systems, agronomic engineering, and food quality and safety, as well as agricultural engineering. The higher education system equips students with the necessary skills to carry out agricultural or processing activities; however the digital aspect of it is at present insufficient. Some examples of new interdisciplinary programmes exist such as 'Information Management in Agribusiness or Business Informatics', or a programme dedicated to the agribusiness system and developed by the Faculty of Economics and Agribusiness of the Agricultural University of

Tirana. In addition, the Agricultural University of Tirana has set up an Experimental Didactic Farm to help equip students with cutting-edge skills in agri-food. The farm is one of the largest farms in the country with an area of 117.5 ha and is used to develop a pilot farm for students to train in precision agriculture[5]. Moreover, the university, in cooperation with the Albanian Development Fund, is in the final phase of developing a project to expand the use of the farm in terms of innovative technologies and knowledge transfer.

[5] AUT- MARD agreement, 2022.