European Training Foundation

IDENTIFYING TECHNOLOGICAL CHANGES AND SKILLS NEEDS IN THE WESTERN BALKAN AGRI-FOOD SECTOR

COUNTRY REPORT: *Albania*

THE EU AGENCY SUPPORTING COUNTRIES TO DEVELOP THROUGH LEARNING

The study is coordinated by **PPMI**

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INTRODUCTION

This report 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 report focuses specifically on the Albanian agri-food sector and aims to identify the skills needs and technological changes that have taken place between 2017 and 2022, within three specific niches of the sector: digitalisation in agri-food, biochemical and microbial products for agri-food, and organic and functional foods.

To answer the questions, the report has relied on qualitative and quantitative research. Through desk research, we have analysed both qualitative and quantitative data, including sources such as the Labour Force Survey (LFS) and the Statistical Yearbook of Albania from the Institute of Statistics of Albania (INSTAT). In addition, the report focused on the relevant sources from the European Union (EU), such as Eurostat and international sources, like the Food and Agricultural Organization of the United Nations (FAO) and the World Bank in Albania. Furthermore, we conducted 19 interviews with business stakeholders from the three niches, public sector representatives, business intermediary bodies, and skills and training providers in Albania.

The report first provides a general overview of the agri-food sector in Albania, including information on employment levels, education and training opportunities, and support for small and medium-sized enterprises (SMEs). The three niches are then discussed in detail. The relevant skills demand and supply trends are overviewed, along with the capacity to match these demands. The report concludes with general remarks and specific recommendations aimed at addressing gaps in funding, education, and upskilling in the agri-food sector in Albania. Most of the detailed statistics tables and figures used in report can be found in the Annex.

OVERVIEW OF THE AGRI-FOOD SECTOR

Structural business statistics

Albania is a developing country that is classified by the World Bank as an upper-middle-income country.[1] It has undergone major structural changes since 1990s. Albania's GDP stood at EUR 16.9 billion in 2021, or EUR 6,072 per capita, thus making it one of the poorest countries in Europe.[2] In the process of liberalisation, the economy moved to functional market structures and the share of different sectors in the country's GDP changed dramatically. The contribution of the agricultural sector decreased from 54.6% in 1995 to 20.4% of GDP in 2021.[3] This change is also a result of the changes in the level of population that is concentrated in rural areas, with many people emigrating from the rural areas into cities. At the same time, the share of the Albanian population living in the rural areas is still high, with around 37.1% people living there.[4] Those employed in the agricultural sector represent about 33.8% of

[1] The World Bank in Albania. Available here.

[2] The World Bank, GDP per capita – Albania. Available here.

USD converted to EUR based on ECB's exchange rate from January 2023, available here.

[3] INSTAT, Statistical Data (1992-2021). Available here.

[4] The World Bank, Rural population (% of total population) – Albania. Available here.

the total number of the employed at the national level. In this regard, the future development of the agri-food sector remains a determining factor in the country's growth.

Agriculture in Albania is family-based, meaning that it is primarily oriented towards subsistence or semi-subsistence. There were 321,492 farms in Albania in 2021, with an average surface of about 1.26 ha.[5] These are divided into several plots per farm ranging from around 0.3 to 0.5 ha.[6] As a result, Albania has the smallest farm size in the Western Balkans region.[7] Small farms and small-scale producers comprise most of the farming population in Albania. In addition, there were 1,354 registered enterprises in the sector of Agriculture, forestry and fishing in Albania in 2021. About 90% of the registered enterprises in the sector were micro enterprises with one to four employees.[8]

To estimate the production according to activities in the agri-food sector, we used INSTAT[9] data from the supply table at basic prices and have included a transformation into purchasers' prices and presented the results in Table 1. The production of the sector of agriculture, forestry and fishing (NACE A1-A3) amounted to EUR 2,7 million in 2021. The production activity in the sector of food products, beverages and tobacco products (NACE C10-C12) amounted to EUR 1 million in the same year.

TABLE 1. PRODUCTION ACCORDING TO ACTIVITIES IN VALUE

OUTPUT OF INDUSTRIES (NACE) in 2021				
Code	**Description**	**Agriculture, forestry and fishing A01-03 (ALL mln.)**	**Agriculture, forestry and fishing A01-03 (EUR mln.)**	**Percentage/ tot.**
CPA_A01-03	Products of agriculture, forestry and fishing	314	2.7	11.9
CPA_C10-C12	Food products, beverages and tobacco products	116.7	1	4.41

Source: INSTAT (2021). Output of Industries (NACE). Available here and here.
Note: Conversion to EUR at a rate of 1 EUR = 116,28 ALL (February 2023). Conversion to percentages done by dividing the output by NACE (CPA_A01-A03) with the total output.

There is insufficient data to show the number of enterprises operating in the processing industry.[10] Agricultural production in Albania focuses both on raw agricultural products and processed goods. The Inter-Sectoral Strategy for Agriculture and Rural Development (ISRDA)[11] 2014-2020 outlined the most

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[5] FAO (2021). Annual Statistical Yearbook of Agriculture. Available here. See also Myslym Osmani, Andoni, Mira (2022). Moving Albanian agriculture forward: An effective and inclusive policy agenda matters. *Journal of the Austrian Society of Agricultural Economics (JASAE)*. p. 1225. Available here.

[6] FAO (2021). Annual Statistical Yearbook of Agriculture. Available here.

[7] Myslym Osmani, Andoni, Mira (2022). Moving Albanian agriculture forward: An effective and inclusive policy agenda matters. *Journal of the Austrian Society of Agricultural Economics (JASAE)*. p. 1225. Available here.

[8] INSTAT (2021). Business Registers: Active enterprises by economic activity and size. Available here. Shown in

TABLE 28 in Annex.

[9] INSTAT (2021). Output of Industries (NACE). Available here.

[10] Data is available for companies operating in accommodation and food service activities in Albania, which represented 56.7% of the total number of registered enterprises in 2020.[10]

[11] Albanian Network for Rural Development (2016). Inter-Sectoral Agricultural and Rural Development Strategy 2014-2020. Available here. FAO (n.d.). Inter-Sectoral Strategy for Agriculture and Rural Development–ISRDA 2007-2013. Available here. In addition, see FAO (n.d.). Strategy on Agriculture, Rural Development and Fisheries 2021-2027. Available here.

important products in the agri-food value chain in Albania from an economic, environmental, and social point of view. These included meat and meat products, milk and dairy products, fruit and vegetables, olives and olives oil, vineyards and wine, field crops, as well as flour, and bakery products.

Nevertheless, the **food processing sector** in Albania is small. Its growth is constrained by a number of factors, such as the scarcity of raw materials, underdeveloped vertical integration between the producers of raw materials and the processing industry, and the lack of resources to improve food quality by introducing quality and food safety assurance systems. Furthermore, investments to comply with standards of environmental protection and treatment of waste are limited. However, in the past ten years, the agri-processing industry has grown on average of 3% in turnover and 3.3% in employment each year.[12] With that in mind, some positive changes in the sector are evident, such as the establishment of food safety and food quality systems, albeit only in larger food processing companies.

Overall, **Error! Reference source not found.**Table 2 shows that the most dominant products in agri-food in Albania are cereals, foraged goods, orchards, livestock and vegetables. This is further confirmed by the data from FAO, available until 2021, which shows that the agri-food sector has an increasing trend in value for some of the main agricultural products, such as fruits and vegetables, livestock and crops.[13]

TABLE 2. GROSS PRODUCTION VALUE (CURRENT THOUSAND EURO)

A11	**Items Aggregated**	**2017**	**2018**	**2019**	**2020**	**2021**
1	Agriculture	2,159,158	2,289,051	2,289,215	2,372,473	2,112,052
2	Cereals, Total	183,555	189,786	176,462	185,349	198,654
3	Crops	1,223,159	1,215,007	1,318,166	1,326,479	1,266,749
4	Food	2154,064	2,281,703	2,283,296	2,366,357	2,107,409
5	Livestock	935,999	1,074,044	971,049	1,045,993	845,069
6	Meat indigenous, total	338,493	432,386	323,996	376,367	267,572
7	Milk, Total	411,013	432,526	423,180	437,730	369,937
8	Oil crops, Oil Equivalent	35,907	25,117	35,133	26,605	153,325
9	Roots and Tubers, Total	65,438	73,189	101,281	75,991	69,785
10	Vegetables and Fruit Primary	737,967	748,435	790,606	851,804	768,393

Source: FAOSTAT (2022). Value of Agricultural Production. Available here.
Note: Values at constant USD GPV 2014-2016. USD converted to EUR based on current exchange rate BoA.

Recent trends data show that agricultural production in Albania has been growing.[14] A stable growth in production of permanent crops and vegetables such as tomatoes, cucumber, pepper, and courgettes was recorded.[15] The growing agricultural production has been bolstered primarily by increased demand for agricultural products, increasing EU and government support and subsidies in the sector, and responses of farmers and other sector operators to markets.

Nevertheless, Albania still relies heavily on imports for its food supply. Exports are low and mainly focus on fruits and vegetables. Table 3 shows the trade balance in the agri-food sector. In general, the

[12] AgroTech Expo 2022. Summary. Available here.

[13] FAO (2022). Analysis of agriculture and rural development policy in Albania. Available here.

[14] European Commission (2022). Agriculture in the enlargement countries. Available here.

[15] Instat (2021). Agriculture Statistics. p. 3-4. Available here.

exported products supply the local market and other countries in the region, with the most prominent markets being Kosovo, Serbia, Bulgaria, and Montenegro.[16]

TABLE 3. FOREIGN TRADE ACCORDING TO THE PRODUCTS (FOOD, BEVERAGES, TOBACCO) 2017-2022; MILLION EUR

HS products	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Import CIF	5,385	5,517	5,582	5,205	6,886	8,173
Food, beverages, tobacco	918	916	949	954	1,118	1,283
Export FOB	2,348	2,670	2, 570	2, 339	3, 171	4,186
Food, beverages, tobacco	259	278	304	336	382	445
Trade balance (Exp – Imp.)	-3,037	-2,847	-3,013	-2,866	-3,715	-3,987
Food, beverages, tobacco	-659	-638	-645	-618	-736	-839

Source: INSTAT (2022). Foreign trade according to the products.
Note: The current exchange rate stood at EUR 1 = ALL 116,28 on February 10th.

Despite the efforts done by the government and the private sector, the competitiveness of Albanian agricultural products suffers from high input prices, and difficulties to meet standards requirements. There is insufficient government support in the development of strategies, building capacities, investments and adequate structures for standards, technologies adaption and marketing practices in the sector, thus reflecting negatively on the export balance.

Although the governmental support and subsidies are increasing in Albania, these are still very low in comparison to other countries of the region and the EU average. The governmental support has made up less than 2% of the agricultural GVA or below EUR 50/ha of the Utilised Agricultural Area (UAA) in Albania in 2021.[17] The amount of EU support for agriculture in Albania, developed through IPARD programmes, has been greater than the national budgetary support in the period 2019-2022. The IPARD 2021-2027 programme foresees EUR 112 million of EU funds for agriculture with the Albanian government adding another EUR 34 million.[18]

There is no available data or study on the use of technology and technological trends in agri-food in Albania. Based on the interviews, the level of technological development in agri-food is low, and important barriers exist to agri-food modernisation in Albania. For example, mechanisation and the use of new technologies are limited due to the small size of agricultural holdings. In addition, rural areas in Albania have poor infrastructure and are poorly connected to each other, which hampers development and knowledge exchange. The activity of farms in Albania is characterised by low productivity.[19] There is a lack of confidence and willingness to cooperate among farmers, which is largely a legacy of the negative experience in the former cooperatives of the socialist system. The number of producer groups and co-operatives is small despite efforts to encourage co-operation of farmers in the supply and

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[16] INSTAT (2022). Exports by country. Available here.

[17] FAO (2022). Analysis of agriculture and rural development policy in Albania. Available here.

[18] Taylor, Alice (2022). Albanian farmers receive lowest government subsidies in region. *Euractiv*. Available here.

[19] Lika, Erinda (2021). Sustainable Rural Development in Albania Through Agriculture and Livestock: Challenges in the European Union Perspective. *Journal of Agronomy, Technology and Engineering Management*. Available here.

marketing activities. The small size and poor infrastructure are also important for low levels of sectoral competitiveness of agriculture.

Policy background and key stakeholders

Ministry of Agriculture and Regional Development (MARD) is responsible for the agri-food developments in the country. The ministry responsible for agri-food development in the country is MARD. This institution is responsible for the design and implementation of agricultural development policies in the country. There are four regional agencies for the advisory service in its structure (RAAE), as well as five centres of agricultural technologies transfer (ATTC) at the country level. These support farming activities and the agri-food sector in general. The Agricultural Technology Transfer Centres (ATTC) are set up in the regions of Fush, Kruja, Korca, Vlora, Lushnja and Shkodra, and are responsible for conducting applied research in various fields of agriculture. The ATTCs support MARD in strategy formulation and 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.

Although important, the **public advisory bodies**, such as the aforementioned ministry agencies, 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. MARD emphasises[20] 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.

There are several **associations** and **NGOs** active in the agri-food sector that provide information, counselling, and training to farmers. The AAC (Albanian Agribusiness Council) is a union of agribusiness associations at the national level. It is the largest umbrella organisation in the country. As the representatives of the AAC have told us, the AAC is very active in capacity building as well as training through various projects funded by several donors. Its portfolio includes projects such as the Pilot Project "Ecological Oasis of Butrint." As part of the project, AAC cooperated with the Slovak Foreign Policy Association in the sessions held in Vlora and Srande with working groups focused on socio-economic development models for rural areas and the use of pesticides in organic farming. AAC also organised a workshop for the development of agriculture, focused on the national strategy of agriculture, challenges to employment, unemployment and competitiveness of Albanian agriculture with the best-known experts in the country and the Minister of Agriculture and Rural Development.

Another important organisation is the Association for the Development of Agriculture in the Mountain Districts (ADAD). ADAD has 750 members, structured in 30 groups of producers according to agricultural activities and territories, in the mountain regions of Kukës, Dibër, Korçë and Shkodër. This association provides technical assistance and procures inputs to agricultural producers. There are also many NGOs in the country operating through projects in the entire agri-food sector. Recently, there have been some serious efforts to aid farmers. For example, some digital platforms have been created that

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

offer significant information on market prices and trends for farmers and processors, such as ABA Online, whose representatives we interviewed for the purposes of the digitalisation in agri-food niche.

The banking system is the main financial intermediary in Albania. However, the level of utilisation of financial instruments, such as credits, offered to the agri-food value change in the country is low. This is particularly true for the sector of agriculture, which utilises less than 4% of the total loan portfolio in Albania.[21] The supply of bank credit to agriculture is constrained by the aforementioned structural problems of the sector, including small size of farms and the ageing of farming population. Another important issue in this regard is that most farmers in the country lack assets to be offered as collateral for loans.

Generally, the agri-food sector is one of the priorities of the Albanian government. The medium and long-term goals for Albanian agriculture focus on harmonisation of legislation and practices to the EU rules and standards, in addition to modernisation and restructuring.[22] The Strategy of Agriculture, Rural Development and Fishing 2021-2027 (SARDF)[23] defines two policy objectives to meet these goals:

- Promotion of sustainable and quality food production through the development of a competitive and innovative agri-food sector to meet the needs of people facing medium and long-term challenges related to food security, livelihoods, climate change, and biodiversity loss.
- Development of rural households to help them become more competitive, based on policies that support sustainable use of natural resources, efficient use of agricultural and fishing inputs, and agricultural knowledge and innovation.

Underpinning these objectives are the SARDF's commitments to strengthen the institutional and administrative capacities in the sectors of agriculture and rural development, in addition to strengthening the transfer of knowledge and innovation in the sectors, including agricultural research and advisory (extension) services.

Key strategic documents relevant to the agri-food sector, such as the Integrated Program for Rural Development, envisage projects supporting the foregoing medium and short-term goals. The Ministry of Agriculture and Rural Development (MARD) has kickstarted the Integrated Program for Rural Development (IPRD, also known as the 100 Villages Programme) in 2018. IPRD intends to coordinate development interventions in the areas of 100 pre-selected villages across Albania. The programme follows the cross-sectoral and multi-stakeholder approach to offer a cohesive development programme to the villages, thus breaking away from the fragmented interventions in the country, and addressing issues created by programmes that place too much focus on specific sectors. IPRD develops interventions with integrated investments in the designated areas (i.e. the 100 villages) to strengthen their development potential by incentivising local people to develop industries such as agriculture and crafts.[24]

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

[22] The National Plan for EU Integration 2021-2024. p. 184. Available here.

[23] FAO (n.d.). The Strategy of Agriculture, Rural Development and Fishing 2021-2027 of Albania. Available here.

[24] Global FDI Reports (2022). Albania's 100 Villages revitalization project. Available here.

Nevertheless, overall, the support for agri-food SMEs in Albania is relatively underdeveloped. The studies[25] on challenges faced by the agri-food sector in Albania, conducted by MARD, indicate **several issues** regarding support for agri-food SMEs and skills development in the sector. Indeed, some emphasise the brain drain in the sector, with trends of internal migration from the rural towards urban areas as well as permanent and seasonal emigration mainly to EU countries such as Germany, France, Italy, and Greece, as well as the UK. The phenomenon is widespread among young people coming from the rural areas, thus reducing the numbers of young rural workforce. Furthermore, MARD emphasises limited capacities regarding business development and marketing in agri-food, as well as the poor understanding of the value chain, in addition to low investment in agricultural information centres.

The support programmes offered for agri-food are limited and are used by a small number of actors. Indeed, since agri-food in Albania, and especially sectors such as agriculture, is affected by high informality levels, high levels of family involvement and semi-subsistence activities, it is difficult to assess with precision the number of support programmes and the types of funds, training, and activities offered.

Employment in the agri-food sector

The Albanian labour force was estimated to be 1,4 million persons in 2021, with men accounting for 55.4 % and women for 44.6 %.[26] In terms of general employment in Albania, the employment rate for the population aged 15-64 was 60.9 % in 2021, with about 1,2 million employed people. Out of this number, 55.5% were men and 44.5% women, thus reflecting a roughly split workforce.[27] A total of 162,560 people (11.5%) were estimated to be unemployed in the country at the end of 2021.[28] Out of this number, there were 11.3% men and 11.8% women.[29]

The average monthly gross wage in Albania stood at EUR 491 (ALL 57,191) in 2021.[30] Compared to 2020, the average monthly gross wage for an employee in Albania was higher by 6.6 % in 2021. Gender differences were found at the level of the gender monthly pay gap, which stood at 4.5% (see

TABLE 18 and

TABLE 19 in Annex). The gross average monthly wage per employee in the Agriculture, forestry and fishing was around ALL 35,661 (EUR 307), which was split to ALL 36,400 (EUR 313) and ALL 34,150 (EUR 294) for men and women, respectively.[31] There was a clear difference between the gross average monthly wage per employee and the monthly rate in the agriculture, forestry and fishing sector, which was about 38% lower than the national one. Furthermore, the data analysed show a significant

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

[26] INSTAT (2022). Labour Market 2021. p. 11. Available here.

[27] INSTAT (2022). Labour Market 2021. Available here. See also Figure 9 in Annex.

[28] In addition, there is a high percentage of young people neither in education nor in employment (NEET). See

FIGURE 10 in Annex.

[29] INSTAT (2022). Labour Market 2021. p. 17. Available here.

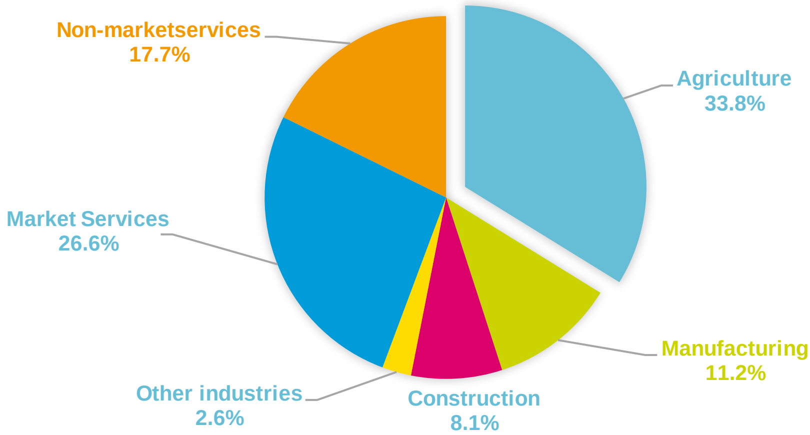
[30] The exchange rate stood at EUR 1 = ALL 116.28 on February 10th, 2023.

[31] INSTAT (2022). Labour Market 2021. p. 53. Available here.

difference between salaries in the Agriculture, forestry and fishing sector, and the Information and communication sector, with an average salary of ALL 86,353 (EUR 742).[32]

Regarding the sectoral shares in employment in Albania, the agriculture sector contributes to a third of the total employment (Figure 1). In addition to agriculture, market services and non-market services make up for a large portion of employment.

FIGURE 1. EMPLOYMENT BY ECONOMIC ACTIVITY IN 2021



Source: INSTAT (2022). Labour Market 2021. Available here.

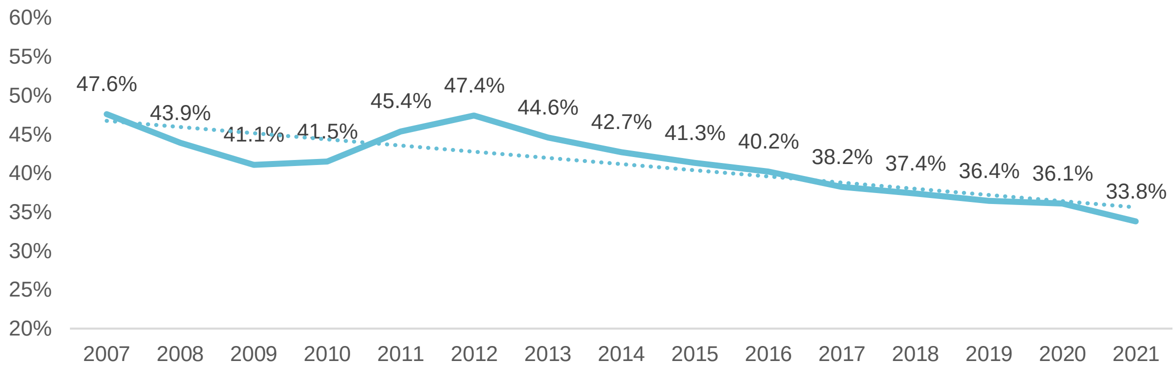
Although a large share of both men and women in Albania are employed in the agriculture sector, these is a significant gender gap (

TABLE 20 in Annex). There is a larger share of women employed in agriculture, standing at 41.4% in 2020 and 40% in 2021, and a smaller share of men, with 31.8% in 2020 and 28.8% in 2021.

Figure 2 presents the trend of employment in agriculture in Albania. There was a notable decrease of the share of agriculture in employment from 2012 to 2021. This suggests that, albeit still important, agriculture's significance in the overall economy and in popularity as a career is decreasing.

FIGURE 2. THE TREND OF EMPLOYMENT IN AGRICULTURE AS % OF THE TOTAL EMPLOYMENT

[32] INSTAT (2022). Labour Market 2021. p. 53. Available here.

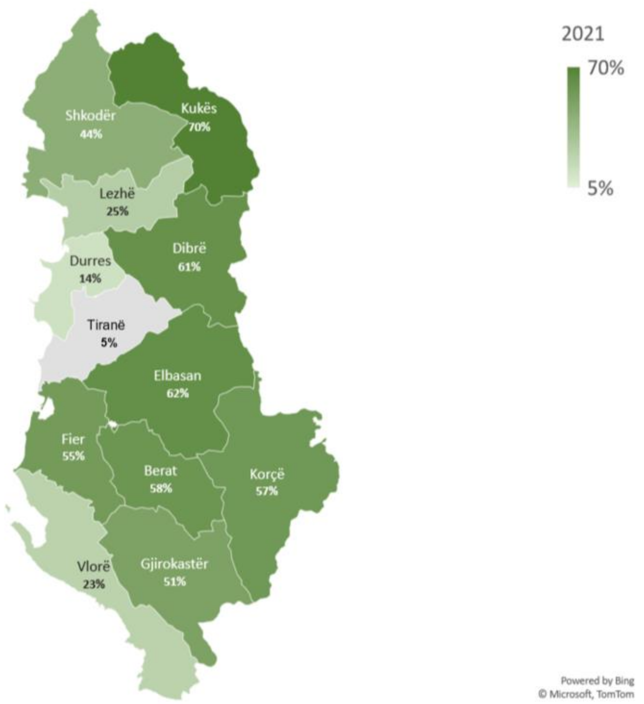


Source: INSTAT. Employment and unemployment from LFS. Available here.

REGARDING THE BREAKDOWN OF THE SECTORAL SHARE OF EMPLOYMENT BY ALBANIAN PREFECTURES, FIGURE 3. EMPLOYMENT IN AGRICULTURE BY PREFECTURES

shows strong differences that exist across the country. Agriculture made up around 70% of employment in Kukes in 2021, in comparison to the capital prefecture of Tirana, where it was only 5%. In general, Figure 3 shows the importance of agriculture for the Albanian economy, while also emphasising regional differences in employment structure.

FIGURE 3. EMPLOYMENT IN AGRICULTURE BY PREFECTURES[33]



[33] See also

TABLE 16 in Annex.

Source: INSTAT. Employment and unemployment from LFS.

People who are skilled in agricultural occupations and workers in commercial agricultural activities accounted for 46.9 % of the total employment in 2021, as visible in Table 4 below.[34] Indeed, in contrast with other occupation groups, in particular managers, professionals and technicians, skilled workers in agriculture and commercial agricultural activities predominate in the economy. Other relevant occupations are clerical, service, and sales workers, and plant and machine operators, and assemblers. Unfortunately, there was a lack of more granular data on the occupation structure in the agri-food sector.

TABLE 4. EMPLOYMENT STRUCTURE BY OCCUPATION GROUPS AND GENDER

Gender	Occupation groups	2019	2020	2021
Total	**Total number and %**	1,265,583	1,243,343	1,248,749
	Managers, professionals, and technicians	18.4%	19.1%	18.9%
	Clerical, service and sales workers	19.1%	19.3%	18.7%
	Skilled agricultural and trades workers	47.3%	46.6%	46.9%
	Plant and machine operators, and assemblers	9.3%	9%	8.3%
	Elementary occupations	5.4%	5.7%	6.6%
	Armed forces	0.6%	0.4%	0.7%
Men	Total number and %	702,612	689,683	693,314
	Managers, professionals, and technicians	15.1%	16%	16.2%
	Clerical, service and sales workers	20.5%	20.6%	19.1%
	Skilled agricultural and trades workers	49.4%	48.5%	49.1%
	Plant and machine operators, and assemblers	8.9%	9.4%	8.9%
	Elementary occupations	5.1%	5%	5.4%
	Armed forces	0.9%	0.6%	1.2%
Women	Total number and %	562,971	553,660	555,435
	Managers, professionals, and technicians	22.4%	22.9%	22.2%
	Clerical, service and sales workers	17.3%	17.7%	18.2%
	Skilled agricultural and trades workers	44.7%	44.3%	44.1%
	Plant and machine operators, and assemblers	9.7%	8.5%	7.5%
	Elementary occupations	5.8%	6.6%	8%
	Armed forces	0.2%	0.1%	0.1%

Source: INSTAT (2022). Labour Market 2021. Available here.

The employment structure of the Albanian economy poses certain problems for the country. As illustrated in Table 5, workers in agriculture have predominantly lower levels of education. In fact, 55.9% of farm managers only have secondary levels of education (e.g. high school) and only 0.4% are graduates of specialised universities for agriculture in 2021.

TABLE 5. FARM MANAGERS BY EDUCATION LEVEL, 2021

[34] INSTAT (2022). Labour Market 2021. Available here.

	Total	Elementary	Secondary	General High school	Agricultural High school	General University	Agricultural University
Total no.	321,492	38,058	179,670	76,495	17,552	8,345	1,372
Total in %	100.0	11.8%	55.9%	23.8%	5.5%	2.6%	0.4%

Source: INSTAT (2022). Regional Statistical Yearbook. Available here.

Furthermore, the labour force structure suggests that the overall labour market in Albania suffers from high informality levels.[35] According to 2021 survey estimates, 47.9 % of the workforce are hired employees, 32% are self-employed (with employees or without employees), and 20.1 % are contributing family workers. In the agriculture sector, some of the existing sources estimate that informal workers account for about two thirds of all workers in agriculture in Albania.[36]

This was confirmed by company stakeholder interviews, where formalisation of business relations in the agricultural sector was emphasised as one of the main challenges for the niche. This is perhaps the reason why skilled agricultural, forestry and fishery workers make up only 2.4% of Albania's unemployed job seekers (see

TABLE 21

TABLE 21 in Annex). The highest unemployment levels for agriculture are in the districts of Elbasan, Shkodra, Lezha and Berat, which are traditional agricultural districts, thus indicating that skills in agriculture are not sought-after in the Albanian market (see

TABLE 22 in Annex).

The employment structure in Albania generally reflects its troubled transition from controlled to open market structures. MARD's sectoral studies[37] emphasise that there is a significant mismatch between supply of jobs and work demand in Albania. The overall number of available jobs offered in the market amounts to only 29% of the number of unemployed jobseekers registered in all employment offices (EOs).[38] This value varies between 48% and 51% respectively in Tirana and Durres and from 6% to 12%, respectively in Kukës and Dibër, even though the latter two regions are among the ones with the lowest income at the national level, which suggests high levels of informality.

Education and training for agri-food

Skills necessary for the agri-food sector in Albania are provided at various level of the national education system, including VET, tertiary level education and CVET.

Secondary vocational education in Albania takes up to four years to complete. Most educational tracks have a structure divided into three or two consecutive levels. After the first general level that takes two years to complete, students are equipped with entry competencies in the occupation. Afterwards, they

[35] INSTAT (2022) Labour Market 2021. Available here.

[36] Bartlett, W., Oruc, N. (2021), Labour Markets in the Western Balkans 2019 and 2020. Regional Cooperation Council.

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

[38] See also

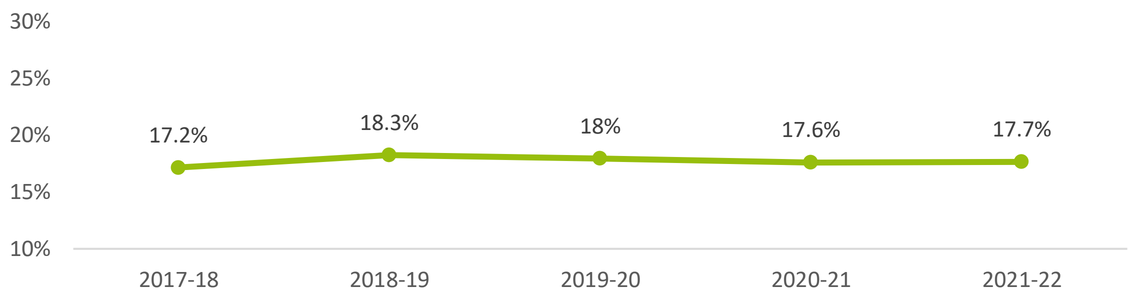
Table **23** showing unemployed jobseekers according to professional categories and gender.

can choose a profile of specialisation. Upon completing the first two years of secondary vocational education, a student gets a vocational certificate and the title "half-qualified worker." The number of students enrolled in vocational education (upper secondary schools) in Albania was around 18% of the total number of students in 2021/2022 (see

TABLE 33

TABLE 33 in Annex). Figure 4 shows that this number has remained relatively stable between 2017 and 2022.

FIGURE 4. NUMBER OF ENROLLED STUDENTS IN VOCATIONAL EDUCATION



Source: Ministry of Education and Sport and the Ministry of Finance and Economy (2022). Administrative data. Available here.

There were 103,467 students enrolled in upper secondary education in Albania in 2021/2022, a decrease of 4.2% when compared to the previous year.[39] Around 82.3% of students enrolled general high schools, such as gymnasiums, and about 17.6% enrolled vocational schools.[40]

Functional learning ecosystems are built around VET providers, for example, through apprenticeship and internship structures. In this context, from 33% to 55% of vocational education curricula are practical training hours (70% in training courses). Schools are flexible in delivering 50% of practical training in the school workshops or providing students with an opportunity to develop these in a professional environment. Providers have created a private company network where students are placed for their practical training as per individual contracts and curricula (for some partners in ICT, agri-food, biotechnology and veterinary, see

TABLE 34, **TABLE 35**,

TABLE 36 and

TABLE 37 in Annex). Company mentors regularly assess the students and participate in the final exam committee. There are some initiatives, such as Skills for jobs, (S4J) to train in-company mentors as well.[41]

The **agricultural vocational education system** in Albania includes nine high schools covering the following areas: crop production (in nine schools), animal production (in one school), veterinary (in two

[39] INSTAT (2022). Education enrolment statistics 2021-2022. Available here.

[40] INSTAT (2022). Education enrolment statistics 2021-2022. Available here.

[41] Swisscontact. Skills for jobs. Available here.

schools), agri-business (in five schools), silviculture, forestry and furniture production (in one school), agricultural machinery (in two schools). Around 3.4% of vocational school students in Albania went to agricultural schools in 2021/2022 (see

TABLE 38 in Annex).

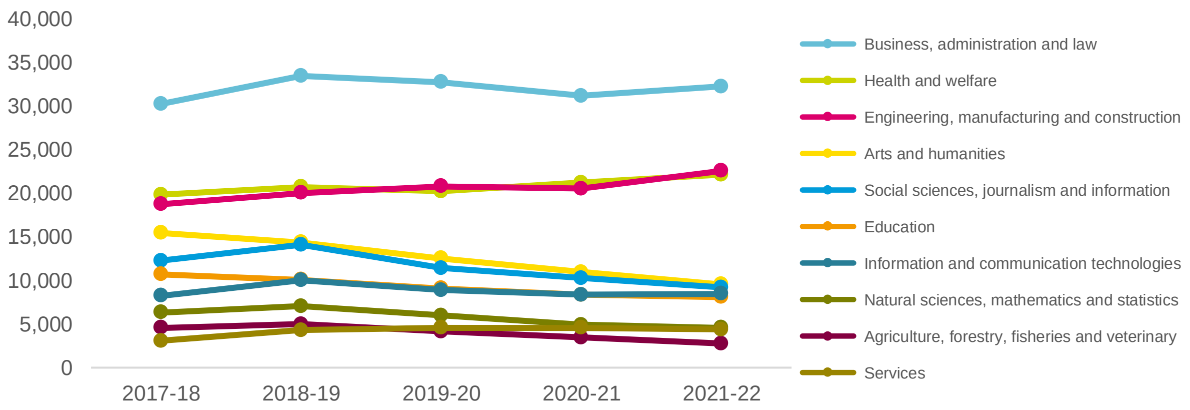
Higher education in Albania is offered and developed by Public Higher Education Institutions and Non-Public Education Institutions (NPEIs), in accordance with the Law on Higher Education 80/2015. There are currently 42 higher education institutions (HEIs) operating in the country, of which 15 are public and 27 of them are private.[42] In 2021-2022, there were a total of 577,869 students enrolled in all levels of education in the country. Out of that number, there were 8,458 in ICT and 2,770 in Agriculture, forestry, fisheries and veterinary (see

TABLE 39 in Annex).[43]

The university-level education in agricultural sciences is provided by the Agricultural University of Tirana (AUT) and the Faculty of Agriculture of the University of Korca. The AUT is the only university specialised in undergraduate and graduate studies, scientific research, training, and extension in the area of agriculture and food processing. AUT's course offer covers agriculture, livestock, forestry, veterinarian medicine, aquaculture and agrarian economy.

Agriculture is decreasing in popularity among Albanian students. Figure 5 shows a significant decrease in the number of students in Agriculture, forestry, fisheries and veterinary falling from 4,564 in 2017 to 2,770 students in 2021.[44] By contrast, there is an increase in popularity of study fields such as Information and communication technologies, Engineering, manufacturing and construction, and Business, administration and law.

FIGURE 5. STUDENTS ENROLLED IN TERTIARY EDUCATION BY FIELDS OF STUDY



Source: Ministry of Education and Sport (2022). Administrative Data. "Fields of Education and Training ISCED-F 2013" Manual. Available here.

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[42] ASCAL Statistics (2021). Available here.

[43] A breakdown of students who graduated in Agriculture, forestry and fisheries and ICT by year, education level and sex can be found in Annex in

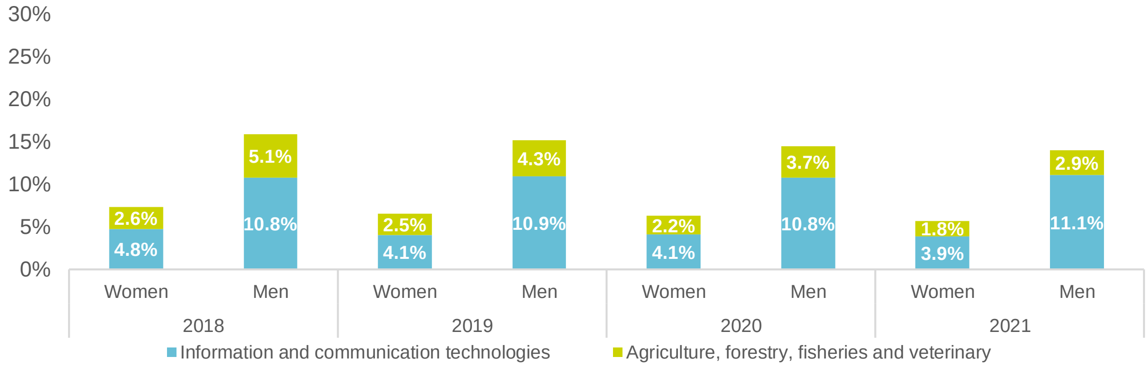
TABLE 40 and

TABLE 41, respectively.

[44] Ministry of Education and Sport (2022). Administrative Data. "Fields of Education and Training ISCED-F 2013" Manual. Available here.

Regarding the gender distribution of student enrolment in tertiary education in Albania, a general gender gap exists. As Figure 6 shows, 11.1% of all men enrolled in tertiary education in Albania in 2021 studied ICT, a slight increase from the period of 2018-2020, compared to 3.9% of women students. Regarding the sector of Agriculture, forestry, fisheries and veterinary education, the overall enrolment was low, with men's enrolment in this field as a proportion of total enrolment in tertiary education decreasing from 5.1% in 2018 to 2.9% in 2021. However, men still marked a higher enrolment rate than women, who stood at 1.8% in 2021, down from 2.6% in 2018.

FIGURE 6. STUDENTS ENROLLED IN TERTIARY EDUCATION ACCORDING TO FIELD OF STUDY BY SEX AND YEAR



Source: Ministry of Education and Sport (2022). Administrative Data. "Fields of Education and Training ISCED-F 2013" Manual. Available here.

The findings above suggest two important things about the formal educational system in Albania:

- Although there is a large workforce with skills in the agri-food sector, specific parts of the agri-food value chain, such as agriculture, are witnessing a decrease in popularity. Some of the main reasons are related to high emigration of workers from Albania, low salaries, demographic changes within the country, and a visible trend of emigration to urban areas. In addition, there is a noted lack of interest of young people to be involved in activities related to agriculture because they are perceived as traditional. The challenge of education in Albania is to maintain sustainable levels of enrolment in agriculture, whilst providing students with innovative and competitive skills and financial support.
- The gender gap in education relevant to the agri-food value chain is significant. The challenge is therefore to bring more women into education, especially in popular sectors such as Information and communication technologies.

In addition to this, students have limited guidance in terms of accessing the labour market and operationalising their skills. Although most of universities have university career centres, these do not address students' needs effectively. Students are faced with insufficient information about the job market and related opportunities, thus indicating a weak relationship of higher education with labour demand.

Regarding the **continuing education opportunities in Albania**, there is collaboration with donors and other relevant non-formal training capacities relevant for the agri-food sector. During 2022, MARD, in cooperation with the Agricultural University of Tirana, initiated the National Agricultural Training Scheme. The training scheme aimed to provide de-localised training in all 12 districts of the country. Its primary objective was to provide up-to-date knowledge in the fields of livestock, agricultural production, fisheries, beekeeping, and milk processing in order to improve competitiveness while maintaining the sustainability of these activities and consumer welfare. The two main target groups for training were extension specialists of the Ministry of Agriculture and Rural Development (approximately 260 of them), as well as farmers according to the dominant typologies of farms in each district (approximately 2,600 in total).

In general, **short term training** courses are offered by public and private (licensed) training centres at the country level. Public training providers offer courses for up to five months. There are 10 public training centres that are distributed all over Albania in Tirana (2), Durres, Fier, Vlora, Gjirokastra, Elbasan, Korca, Shkodra, and one mobile centre (serving mostly north-east Albania). They had 15,143 trainees during 2019.

Moreover, most skills development occurs either on the job, provided by technical experts at work, or other organisations. **On-the-job training** is also provided in the frame of development projects that supply technical assistance to agri-food business, often offered by local experts. However, most of these programmes are **informal** (i.e. attendance certificates are issued, but not recognised formally, for various learning sessions and projects). Coaching and mentoring are prevalent here, especially in technology transfer. Due to the lack of available information, it is very hard to assess the state of play with regards to informal skills development in Albania. There is a low level of confidence in the national employment service and non-formal employment channels.[45]

Representatives from the contacted **business intermediary bodies** emphasised that they offer support for agri-food SMEs through training in the field of business management, environmental protection, new technologies and good agriculture practices. They also offered support through counselling and networking. Training and support opportunities were advertised mainly through the Internet but also through announcements in the social media.

DIGITALISATION IN AGRICULTURE AND FOOD PROCESSING

The niche of digitalisation in agri-food rests on the input level of the agri-food value chain. Digital technologies improve various aspects of the agri-food production, in particular its efficiency, productivity, and consequently 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 patterns monitoring, and robotics becoming more prominent worldwide.

The niche of digitalisation in agri-food is defined as falling 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);

[45] National Agency of Employment and Skills, 2022. For jobseekers per education level, see **TABLE 24** in Annex.

- Information and service activities (J63);
- Research and experimental development on natural sciences and engineering (M72.1).

Although the niche focuses on the businesses that develop and produce digital innovations for agri-food, this comes with significant challenges in Albania. It is important to note that there are no digital technology developers for agri-food in the country, meaning that the analysis for this niche has generally focused on stakeholders that apply digital technologies in agri-food production. 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.

This chapter begins with an overview of the market niche for digitalisation in agri-food in Albania, highlighting its key economic indicators. It further presents the stakeholder views skills demand and supply for the niche. Finally, it provides an overview of what programmes, tools, and activities that are available in Albania to match the demand and supply in the niche.

The profile of the market niche and the stakeholder ecosystem

General context

Albania started laying the groundwork for its national digitalisation in agriculture (e-agriculture) strategy and vision in 2019, with the support of the FAO Regional Office for Europe and Central Asia, which continued in 2020.[46] Although there has been an increase in the use of new information and communications technologies (ICT) in the last two years in Albania, the National Plan for Sustainable Development of Digital Infrastructure, Broadband 2020-2025, notes that there is a significant digital divide between the rural and urban areas, especially due to the lack of adequate infrastructure for internet connectivity. In this context, the International Telecommunications Union (ITU) has already identified in 2016 the lack of rural connectivity as "one of the major gaps" that hampers growth in the country.[47] For example, almost 90% of the total fixed connections are in the urban areas and only 10% in the rural areas. The digital divide in urban and rural areas remains high.[48] Some key reasons for the digital divide relate to the fact that both fixed and mobile broadband access are not yet affordable in Albania, especially in rural and low-income areas, which further hampers the adoption of digital technologies.

The interviewed representatives of the public sector emphasised that digitalisation in agriculture, both in primary production and in the processing of food products, constituted a real opportunity for the development and modernisation of the sector. They agreed that significant impacts in the agriculture sector can be expected from enhancing broadband development and enabling organisational change and facilitating coordination between stakeholders to reap productivity gains from overall investments in the ICT.

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[46] ITU (2020) Status of Digital Agriculture in 18 countries of Europe. Available here.

[47] ITU, ICT Centric Innovation Ecosystem Country Review Albania, 2016. Available here. See also Mulliri, Jona, Baraku, Brunilda and Shahu, Edmira (2022). Digital Technology – The Case of Albanian Agriculture. *International Journal of Economics, Commerce and Management*. Available here.

[48] AKEP and INSTAT (2019). Regional Population Figures.

The research has identified a noticeable trend in the development and utilisation of digital platforms in the field of agriculture. Some of them are in operation today, mostly created as a product of donor support projects such as: ABA Online financed by Japan International Cooperation Agency (JICA) or MisFruit (a MIS-Marketing Information System) financed by German International Cooperation (Deutsche Gesellschaft für Internationale Zusammenarbeit, GIZ). We interviewed both stakeholders, as discussed below. In addition to these stakeholders, farms like Uka near Tirana and Bylykbashi from the Korca region are known for applying innovative digital solutions in their production processes. Furthermore, some larger farms and greenhouses used sensing technologies in Albania, imported from Israel.

There are various **challenges** that the niche faces in Albania, ranging from outdated educational curricula to poor digital connectivity:[49]

- Educational curricula in agri-food are outdated, which further weakens digitalisation in the sector. In particular, the lack of formal educational programmes to develop cross-cutting skills for the niche (combining specialist digital skills with education in agriculture) is notable. Because of these developments, digital transformation is localised to the most urbanised areas of the country, thereby excluding rural areas from digital opportunities.
- As discussed in the previous section, agricultural holdings in Albania are usually small family holdings that practice agriculture for sustenance or semi-sustenance. The structure of agricultural holdings presents a challenge to digitalisation in agri-food. These holdings are usually small, fragmented, and run by families, so they often do not perceive the need for adopting digital technologies in their work. The factors that play a role in digitalising small agricultural holdings are the affordability of digital technologies, but also education levels and the perception of the usefulness of digital technologies.

Apart from the digital divide between rural and urban communities, there are limitations regarding the digitalisation of Albanian businesses. For example, data in Table 6 shows that only about 32.6% of employees in companies with 10-49 employees, and 26.4% of employees in companies with 50-249 employees used computers at work in 2022.[50] Meanwhile, a significantly small number of companies used e-commerce sales in 2022, with only about 12.6% of companies with 10-49 employees being active there and 18.8% companies with 50-249 employees. Therefore, the challenges to digitalisation in Albania affect the whole economy rather than being specific to the agri-food sector.

TABLE 6. USAGE OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN ENTERPRISES BY SIZE CLASS OF ENTERPRISES, 2017-2022

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[49] IFC (2022). Creating Markets in Albania: Country Private Sector Diagnostic. Available here.

[50] For information on usage of ICT technologies by activities, size, and in different years, see in

TABLE 25,

TABLE 26,

TABLE 27 in Annex.

No	Size class of enterprises	Employees using computers at their work (%)					
		2017	**2018**	**2019**	**2020**	**2021**	**2022**
	Total	28.1	26.0	26.8	27.2	27.8	31.3
1	10-49 employed	31.3	27.8	29.5	29.8	30.0	32.6
2	50-249 employed	21.6	19.8	21.5	22.1	22.9	26.4
3	250+ employed	32.4	32.0	30.6	30.8	32.0	36.3
No	**Size class of enterprises**	**Enterprises that did e-commerce sales** (10+ employees) **(%)**					
		2017	**2018**	**2019**	**2020**	**2021**	**2022**
	Total	7.7	5.6	5.8	12.8	13.3	13.8
1	10-49 employed	6.4	4.6	5.0	11.9	12.5	12.6
2	50-249 employed	13.3	9.0	8.2	14.5	16.2	18.8
3	250+ employed	12.9	16.9	15.1	19.7	23.5	18.2

Source: INSTAT (2022). Usage of Information and Communication Technologies in Enterprises. Available here.

As findings in other countries show, most of the companies operating in the niche come from the ICT sector. In Albania, there were 4,005 enterprises operating in this sector in 2021, amounting to about 3.4% of the total number of enterprises in that year.[51]

TABLE 28 in Annex shows that around 85% of companies operating in ICT had from one to four employees, while companies with 5-9 and 10-49 employees accounted for 7% of each category, respectively. By 2022, the number of enterprises in this sector had increased by 37% compared to 2017,[52] demonstrating rapid growth.

The sector of Information service activities (J63) also recorded the highest average gross monthly salaries in Albania in 2020-2021. However, as in other sector, notable gender pay gap existed in 2021, at 11.6%: men working in the ICT sector were paid ALL 91,126 (EUR 777) and women ALL 80,579 (EUR 687) in 2021 (see

TABLE 19 in Annex).

Companies in the field were mainly involved in activities related to web development, 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.

Key stakeholders

The ecosystem of stakeholders in this niche is limited. The key public stakeholder with influence on the niche is the MARD. Albania lacks a dedicated ministry for innovation and technological development, with responsibilities shared between ministries that are relevant to different sectors. There is a lack of public initiatives to digitalise agriculture in Albania. Hence, most of the work is carried by NGOs, companies, intermediary bodies, and international organisations, albeit in a limited sense.

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

[52] INSTAT (2021). Business Registers Database. Available here.

There are no specialised intermediary bodies focused specifically on the development of digitalisation of agri-food and support for companies developing the relevant solution in Albania. Nevertheless, activities of the bodies such as SME Albania, Albanian Agribusiness Council (AAC) and Tirana Chamber of Commerce and Industry (CCIT Tirana) interviewed for this study are relevant to the niche. Although these business intermediary bodies are not specifically dedicated in the digital aspect, they are active in the implementation of donor projects as well as workshops and policy-making initiatives of government agencies. This, among others, constitutes a contribution to the development of the market niche of digitalisation in agri-food.

Regarding international stakeholders, FAO and the EU stand out as most relevant. Other relevant international stakeholders are GIZ and JICA. They engage in activities to develop the startup ecosystem in Albania. EU's activities have supported the modernisation of Albanian agri-food in general, with over EUR 70 million invested between 2017 and 2022.[53]

Companies representing the niche

The levels of digitalisation in the agri-food sector in Albania are low, and no digital technology developers for the agri-food niche were found in the country. Therefore, the interviewed business stakeholders mainly applied innovative solutions for agri-food, instead of developing or producing them. Companies MisFruit and ABA Online provide the technology adoption in agri-food perspective, which shed some light on the reasons why the development of such technologies in the country is barely existent.

The interviewed companies provided information and services in agri-food. ABA Online[54] was a digital platform that provided information and services in the agricultural sector, with the aim of educating and networking farmers. MisFruit[55] was a Marketing Information System (MIS) that tracked agricultural prices in Albania in real time, and they maintained a database of agricultural producers in the country. Both companies were established as part of collaboration projects with international partners such as JICA for ABE Online and GIZ for MisFruit.

The companies were small businesses. At the time of data collection, ABA Online had 20 employees, 14 men and 6 women. All employees at ABA Online were educated at tertiary level, mainly in the fields of administration, engineering, and production. MisFruit was a smaller company, with six employees at the time of data collection (four men and two women). All MisFruit's employees were educated at tertiary level as well, mainly in administration and production.

The companies identified and recruited employees mainly through social media, recommendations from manufacturers, personal acquaintances, and professional networks. They generally recruited recent graduates, who were then employed on a full-time basis.

Skills demand in the niche

Due to the specificity of their businesses, the interviewed companies representing the niche emphasised the increasing demand for cross-cutting skills. On the one hand, this concerns a set of technical skills

[53] Western Balkans EU (2022). Available here.

[54] ABA Online. Available here.

[55] Mis Fruit. Available here.

combining knowledge in agriculture with specialist ICT skills in social and digital media and in the implementation of innovative technologies in agriculture like the Internet of Things (IoT). On the other hand, the technical skills profiles need to be complemented by knowledge related to marketing, human resources (HR) and business development.

Skills in the ICT sector are some of the most demanded skills in Albania, including for the niche of digitalisation for agri-food. The interviewed stakeholders 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 related to sensing technologies and precision agriculture;
- general skills in agronomy and/ or food technology;
- specialised skills in agronomy and agriculture, such as ability to document organoleptic analyses and physico-chemical and microbiological analysis for patterning raw materials in food processing;
- applied knowledge on new technologies and methods for implementing innovative systems in agriculture related 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.

Furthermore, as the most important for business development, skills in marketing management, accounting and legal services were mentioned. Nevertheless, the interviewed companies emphasised that employees with creativity in building business relations (e.g. networking) and economists are the easiest graduates and skills 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 are very hard skills to find.

Demand for these skills can be addressed by a number of occupational profiles, based on ESCO classification (see the table below).

TABLE 6. OCCUPATIONS RELEVANT FOR THE DIGITALISATION IN AGRI-FOOD

Technical occupations related to smart agriculture	
• 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

Technical occupations related to agriculture and food processing	
• 2132.1 - agricultural scientist • 2132.2 - agronomist	• 3142.1 - agricultural technician • 2145.1.4 - food technologist
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 interviewees also identified skills that they think will be important in the future. As the economic environment in Albania is developing quickly, the need for skills in the labour market is expected to change rapidly. The interviewees agreed that the new skills that will be needed in the agri-food sector in the future were software development with specific focus on agricultural information systems to consistently provide accurate, timely and easily accessible information used to: track and manage data related to crop and livestock production; collect and manage data related to field operations; collect and manage data related to weather and climate condition, applied digital research competencies, including the ability to work with data and to use ICT technologies to find, evaluate, create, and communicate information. Moreover, the ability to use sensorial technologies (IoT) will become more demanded in the future. In the view of stakeholders, soft skills such as forging and maintaining business relationships, though currently abundant, will remain crucial in the future.

Nevertheless, a major obstacle for the more systematic approach to skills development for the niche is the lack of demand across the agri-food sector. There is a very limited number of agricultural holdings that use technologies that would require such skills.

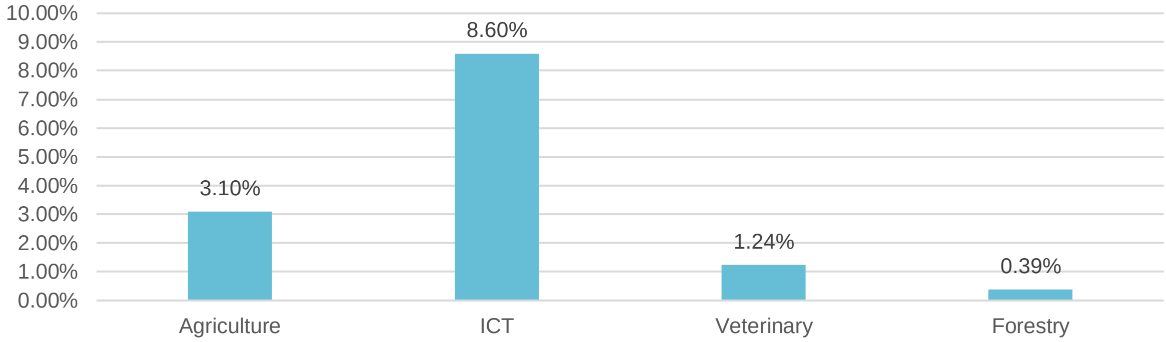
Skills supply

Skills that are relevant for the companies operating in the niche, primarily skills in ICT fields, in Albania are provided both at VET and higher education levels. Generally, Albania's government's priorities in education focus on the digital agenda. The curricular improvements carried out by educational institutions address the use of technologies in agricultural education. Yet, this education is usually very generic, focusing on the very basic skills related to computer operations or software use. The existing courses and programmes do not seem to fully satisfy the skills needs mentioned by the interviewed companies.

Vocational secondary education relevant for the digitalisation in agri-food niche in Albania is limited, although various VET institutions and high schools across Albania offer different courses related to agri-food and ICT. There are 34 public vocational schools in Albania, out of which 11 offer tourism & hospitality qualifications. Nine schools offer agriculture qualifications, with five of them offering training in veterinary occupations. There is only one vocational school in Albania offering forestry-related occupations (in the city of Shkoder).

Figure 7 shows some of the vocational school programmes and their enrolment data. Vocational institutions offering education in ICT and computer programming and software development made up more than 10% of the enrolment in 2021-2022, while agriculture made up only 3.4% of the total number. Biotechnology programmes stood at 4.4% of enrolment, indicating their popularity as well, whereas veterinary and forestry programmes marked the lowest enrolment.

FIGURE 7. NUMBER OF STUDENTS ACCORDING TO MAIN VOCATIONAL SCHOOL PROFILES, 2021-2022



Source: National Employment and Skills Agency (2022). Statistical Bulletin. p. 77. Available here.
Note: We calculated the data by taking the percentage of the total number students enrolled in vocational education in Albania (17.6% or 17,589) out of the total number of students in upper secondary education (103,467). We then calculated the percentages for the fields against that total.

It is important to note that these programmes equip students with sector-specific skills and lack the multidisciplinary character required by the market. 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, as discussed above. Such programmes seem to be ad hoc since Albania has not yet introduced a dual system of education.

TABLE 42 in Annex shows that universities offered 19 programmes in ICT and software management and enrolled around 1,491 students in 2021.

BOX 1. PROVIDERS OF HIGHER EDUCATION IN ICT

- University of Tirana
- Polytechnic University of Tirana
- Alexander Moisiu Durres University
- Luigj Guarakuqi University
- Alexander Xhuvani Elbasan University
- Ismail Qemali University
- Eqerem Cabej Gjirokastr University
- University Fan S. Noli Korte
- Agricultural University of Tirana

The foregoing study programmes are mostly new, so there is a lack of information on their connection to agri-food. However, we identified several new courses that are relevant in this regard. These include information management for agro-businesses, business informatics, management of information systems, agronomic engineering, food quality and safety, as well as agricultural engineering.

There are also other developments that have the potential to help with niche growth. For example, the Agricultural University of Tirana (AUT) has set up an experimental didactic centre (DEF) to help equip students with cutting-edge skills in agri-food. The Didactic Experimental Farm (DEF) is one of the largest farms in the country with an area of 117.5 ha. As part of its DEF, and in cooperation with the Ministry of Agriculture and Rural Development (MARD), the AUT is developing a national pilot farm for student training in precision agriculture.[56] This farm will serve as a national practice centre and will be used for various trainings by MARD. At the same time, AUT in cooperation with the Albanian Development Fund is in the finalisation phase of the preparation of the project for the transformation of DEF into an Integrated Thematic Park with a value of about EUR 6 million. Amongst others, the use of innovative technologies as well as knowledge transfer will be part of the functionalities of this park.

CVET provision in Albania largely focuses on providing skills for the usage of digital technologies and not the development of technologies. One important stakeholder is the National Agency of Employment and Skills. This agency developed a “Digital Competence” curriculum in 2021. The curriculum identifies five competences and skills in accordance with the EU Digital Competence Framework 2.0, such as digital content creation and the use of internet, amongst others.[57] These competences are aimed towards the general population and job seekers who want to develop their professional knowledge in the field of ICT. The courses were attended by 8,858 persons in 2021 and there were 3,941 still enrolled in some courses (**FIGURE 11** in Annex). It is important to note that while these courses are not connected to agri-food sector specifically, they seek to develop basic digital skills at the general level in Albania. Lack of these remains an important obstacle for the digitalisation agri-food in the country, as outlines previously.

On-the-job training remains very important for the niche. The interviewed companies argued that, in terms of skills supply, trained specialists in Albania had the necessary skills to participate in the agri-food sector, but that they also needed at least 12 months of additional training to develop appropriate practical skills for the workplace related to the usage or adoption of digital technologies. To address those gaps, the interviewed small companies developed their own training sessions to educate 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.

The interviewed companies stated that they provided in-house short-term training which was mainly related to professional knowledge relevant to agri-food and their projects. The training took place internally at the company’s premises and was also optimised for hybrid delivery. Training programmes were tailored to the specific needs that the company had for its employees and were carried out free of charge.

Furthermore, the companies also said that they outsourced certain training activities to educational partners. They emphasised cooperation with Banks' Association, JICA (Japan International Cooperation Agency), ADGF (Albanian Development Guarantee Foundation), Rabobank, AMF (Financial Oversight Authority) and other foreign programmes operating in Albania. There was no evidence of cooperation with trade unions.

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[56] AUT- MARD agreement, 2022.

[57] EU Digital Competence Framework 2.0. Available here.

In addition to the training courses organised by the companies themselves, business intermediary bodies help to supply SMEs with the some of the needed knowledge and skills. Business intermediary bodies interviewed emphasised that they provided support for agri-food SMEs, such as provision of information, training, counselling, coaching, mentoring, networking, and project implementation. Some of them provided online trainings in digital skills, with digital marketing being one of the targeted areas.

SME Albania is one of the intermediary bodies that help fill in the skills supply gap in the country. An example of their work is the SME Academy, a six-day summer academy running from 2017 that equipped SMEs with the necessary theoretical and practical knowledge addressing the market and social changes in the country. The participants were mainly business as well as agro-processing industry representatives and young people with innovative ideas. During the academy, different sessions and lectures informed the attendees about new practices and concepts in business management in order to be competitive both in the local and international markets. The Academy also helped develop business development skills by encouraging young people to commercialise their ideas. At the time of the interview with their representatives, SME Albania was preparing a project in close collaboration with the University of Korce (Department of Agribusiness) and some experts from the Faculty of Economics and Agribusiness of AUT, within the framework of an EU-funded project. The project aimed to raise human capacities, train young people, and implement sensorial technologies on apple farms in Korca region.[58]

Overall, while **CVET** education in the niche of digitalisation in agri-food exists in Albania, since the whole niche is in very early stages of development, there are no business support services that tailor programmes specifically for developers of technologies for agri-food in the country. Instead, most programmes focus on the application of digital technologies in agri-food.

Matching the demand and supply

Although the niche of digitalisation is poorly developed in Albania, the demand for digital skills and their application in agri-food is evident and is anticipated to increase in the foreseeable future due to the international expansion of digitalisation and new technologies. Therefore, it is important to develop systems to match the demand and supply and guarantee the sector’s sustainable growth. Yet, there are several issues in this regard:

- There is low demand for digitalisation of agri-food in Albania and low demand for digital skills. Some demand exists, especially related to skills in digital marketing and e-commerce. The demand for digital skills is expected to grow due to global trends and foreign competition, in addition to Albania’s EU integration process.
- There are no developers of technologies for the agri-food sector in Albania. This indicates that the niche of digitalisation in agri-food in Albania has a low development potential.
- To overcome this situation, it is necessary to strengthen higher education programmes related to the development of digital technology in agriculture, mainly through internationalisation and better financing of programmes. Moreover, there is a need for supporting policies for business stakeholders operating in the agri-food sector.

[58] The project was prepared in response to the European Innovation Council and SMEs Executive Agency’s (EISMEA) call, available here. However, it could not have been submitted due to technical reasons. The representatives of SME Albania indicated that they had a project ready to go and were waiting for the first opportunity to apply for funding.

- There are VET programmes oriented towards ICT, but very few of them offer knowledge, or how to apply digital solutions in agri-food. For example, agricultural VET schools seem to cover only basic digital skills.
- The Albanian higher education system equips students in the agri-food sector with the necessary skills to carry out agricultural or processing activities, however the digital aspect of it is insufficient at present. We identified a small number of new interdisciplinary programmes that may help in this regard such as Information Management in Agribusiness or Business Informatics, a programme dedicated to the agribusiness system and developed by the Faculty of Economics and Agribusiness of AUT.
- Non-formal learning at companies, and other settings is not yet recognised in Albania as a mechanism to support the niche development. There are business intermediary bodies that fill some of the skill gaps in the niche, but there is a weak relationship of such initiatives to the overall labour market demand, especially in training in specialised digital skills.
- Albania is experiencing a rapid growth in the number of companies in the ICT sector. However, the collaboration between these companies and the agri-food producers is very basic. Partly, the problem is the structure and the size of enterprises in agri-food in general, and of agricultural farms in particular. An important factor to mention is also the salary gap between the employees that work in agri-food and ICT. The average salary in agri-food sector is much lower than the average salary in ICT.

BIOCHEMICAL AND MICROBIAL PRODUCTS FOR AGRI-FOOD

The niche of biochemical and microbial products for agri-food stands on the input level of the agri-food value chain. This niche is essential for producing necessary crops and innovating in agri-food in general and food production in particular. The niche of biochemical and microbial products for agri-food encompasses the following NACE sectors:

- Manufacture of fertilisers and nitrogen compounds (C20.1.5);
- Manufacture of pesticides and other agrochemical products (C20.2);
- Research and experimental development on biotechnology (M72.1.1).

The niche of biochemical and microbial products for agri-food in Albania is underdeveloped. In fact, Albania does not have the capacities to produce fertilisers and nitrogen compounds, nor to manufacture pesticides and other agrochemical products. There are no developers of biochemical and microbial products that could represent the niche in Albania.

This chapter begins by presenting an overview of niche of biochemical and microbial products for agri-food in Albania and potential for its emergence in the future. Then, we discuss the skills demand and supply for the niche. In addition, we discuss what programmes, tools, and activities that are available in Albania to match the demand and supply in the niche.

The profile of the market niche and the stakeholder ecosystem

General context

Albania has no production of fertilisers, nitrogen compounds, pesticides, or any other agrochemical products. The country imports all the pesticides, fertilisers, various chemicals for detergents, lubricating oils, chemicals, and raw materials for the agri-food industry. Therefore, the only Albanian companies related to the niche are companies engaged in the imports and sales of fertilisers and plant protection products rather than their development or production.

Table 7 shows the import-export balance concerning chemical and plastic products in Albania. The table suggests the expansion of the import levels. For example, between 2017 and 2022, the value of imports of chemical and plastic products has increased from EUR 741 million to EUR 1 billion. Although Albania does not produce plant protection products (PPPs) or fertilisers, the interviewed experts have noted that there is some export activity regarding the exports of chemical products. They suggested that most of the export activity is consigned to exporting plastic products. The data below shows that exports have grown from EUR 40 million to EUR 151 million between 2017 and 2022.

TABLE 7. IMPORT-EXPORT BALANCE FOR CHEMICAL AND PLASTIC PRODUCTS IN ALBANIA IN 2017-2021 (EUR)

HS products	2017	2018	2019	2020	2021	2022
Total import CIF (cost, insurance and freight)	5.4 billion	5.5 billion	5.6 billion	5.2 billion	6.9 billion	8.2 billion
Import CIF for chemical and plastic products	**747 million**	**755 million**	**763 million**	**782 million**	**986 million**	**1 billion**
Total export FOB (free on board)	2.3 billion	2.7 billion	2.6 billion	2.3 billion	3.2 billion	4.2 billion
Export FOB for chemical and plastic products	**41 million**	**53 million**	**66 million**	**64 million**	**92 million**	**152 million**
Total trade balance (Exp - Imp.)	-3 billion	-2.8 billion	-3 billion	-2.9 billion	-3.7 billion	-4 billion
Trade balance for chemical and plastic products	**-707 million**	**-701 million**	**-697 million**	**-719 million**	**-895 million**	**-855 million**

Source: INSTAT (2022). Foreign trade according to products, 2018-2022. Available here and here. Data for 2017 available here.
Note: Conversion rate is EUR 1 = ALL 116.28 (February 2023).

During the past five years, some companies have also developed packaging or partial processing activities. The total number of retail units of plant protection products was 412 in 2021. There were 19 companies that that import PPPs from abroad in Albania, mostly in the Fier district. The total number of retail units for fertiliser products was 646. There were 57 companies that import fertiliser products to Albania.[59] It is not clear, however, how many of these companies specialised specifically in biochemical and/ or microbial products for agriculture.

In overall, there is notable domestic demand for chemical products for agriculture. In 2012, the Institute of Public Health in Albania prepared the Second National Profile of Chemicals Management in Albania,

[59] Structure of plant protection, MARD 2022.

in cooperation with the United Nations Institute for Training and Research (UNITAR). The profile, which was first prepared in 1996, discussed Albania's management of high-risk chemical facilities that were abandoned after the transition from communism. In particular, the profile documented the rise in the use of PPPs in Albania from 2009 onwards, suggesting that the use was moderate.[60] However, as we can see from Table 8, the total use of PPPs in Albania has more than quintupled between 1990 and 2019, although we note oscillations for various types of PPPs in the period of 2010 to 2019.[61]

The highest use of PPPs has been recorded for fungicides and bactericides, at 352 tonnes in 2019. The increase in the use of PPPs suggests an increase in cultivation of intensive crops in commercial farms mainly related to producing vegetables in greenhouses and fruits. This development further suggests the growing importance of chemical PPPs in the agri-food production in Albania, and the growth of the import sector, which we discuss below.

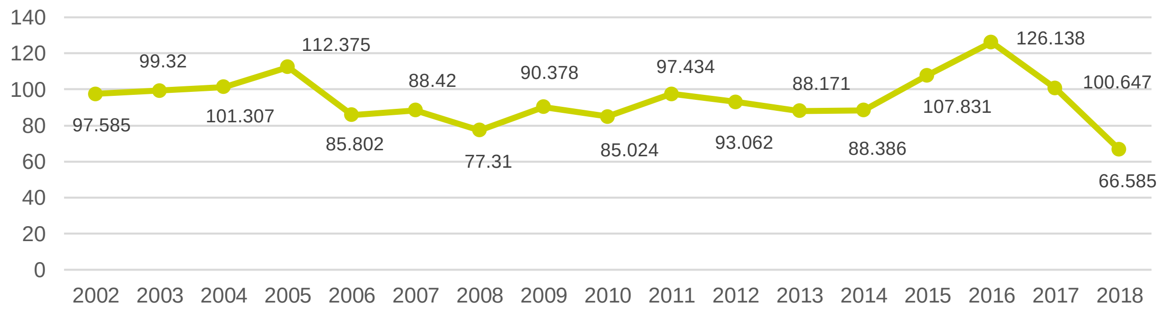
TABLE 8. USE OF PESTICIDES IN ALBANIA

Value (tones)	1990	2000	2010	2015	2016	2017	2018	2019	2020
Total Pesticides	121	308	590	538	584	615	442	730	756
Insecticides	70	170	376	149	182	191	119	142	146
Herbicides	5	8	7	68	34	56	66	117	128
Fungicides and Bactericides	44	106	189	236	232	241	199	352	380
Insecticides – Seed Treatments	0	9	2	7	8	11	9	9	0
Rodenticides	2	8	9	68	117	103	36	61	64
Plant Growth Regulators	0	6	0	0	1	1	2	37	37
Other Pesticides	0	2	7	10	10	11	11	11	0

Source: FAOSTAT (2021). Pesticides Use. Available here.

At the same time as the use of PPPs has posted growth rates, the use of fertilisers in the country started decreasing. The use of chemical fertilisers stagnated in the period of 1998-2009, averaging at around 250 tons per year. It started growing in the late 2000s before experiencing a sudden drop in 2016. Figure 8 shows that for every hectare of arable land in Albania, agri-food producers have consumed around 66.6 kilograms in 2018, a sudden drop from 2016 when they consumed around 126 kilograms.

FIGURE 8. FERTILISER CONSUMPTION (KILOGRAMS PER HECTARE OF ARABLE LAND) - ALBANIA



Source: World Bank Data, 2019. Fertiliser consumption. Available here.

[60] UNITAR (2012). National Profile of Chemicals Management in Albania. p.11. Available here.

[61] For imports of PPPs, see **TABLE 30** in Annex.

There was also an increase in the use of new fertiliser types, especially crystalline ones, but also of plant nutrients. The new fertilisers better respect the rules for the preservation of the environment, the reduction of waste in the soil and agricultural products. As we can see in Table 9, the use of Nutrient potash (K2O) has increased significantly in the period from 2016-2020, whereas the use of phosphates and nitrogen has slightly decreased.

TABLE 9. FERTILISER CONSUMPTION IN NUTRIENTS (KILOGRAMS PER HECTARE OF ARABLE LAND)

No.	Item Code	Item	2016	2017	2018	2019	2020
1	3103	Nutrient phosphate P2O5 (total)	34,544	21,263	13,358	15,087	22,898
2	3102	Nutrient nitrogen N (total)	42,896	39,184	24,769	38,329	32,578
3	3104	Nutrient potash K2O (total)	803	634	2,579	4,190	5,339

Source: FAOSTAT (2023). Fertilisers consumption in nutrients. Available here.

Generally, when new varieties of chemical, biochemical and microbial products are introduced in Albania, they are first tested in different types of farms (e.g., depending on size). If they prove successful, they are then placed in the market. However, there have been concerns that input suppliers are incentivised to sell farmers products that ensure them higher commission profit margins, without considering farmers' needs or even the appropriate dosages of certain chemicals. There are also concerns about the professional competence of some input suppliers that expose farmers to risk.

Key stakeholders

The National Food Authority (NFA) is responsible for official controls of fertilisers and chemical products used in food production in Albania, based on laws such as the Law No. 17-2020 For fertiliser products. The NFA has 12 offices across prefectures in Albania. They conduct an annual inspection to monitor the trade in plant protection products (PPPs). They also conduct annual quality control inspections of business operators that import and retail PPPs.

The ecosystem of stakeholders relevant in this niche is limited. There are no specialised intermediary bodies for the niche. Support for skills development usually comes as part of the general support for agriculture.

The activities of other business intermediary bodies**,** such as SME Albania, AAC, and CCIT Tirana, do not target the niche specifically. The research could not identify specific programmes and examples of collaboration aimed at developing biochemical and microbial products in Albania.

Companies representing the niche

The businesses that operate in the niche and that import agricultural inputs in Albania are listed in

TABLE 29 in Annex. We interviewed representatives of three businesses from this list: Agrimatco Albania shpk., Planta shpk, and Agroinput Jazxhi shpk.

The interviewed stakeholders were limited liability companies that had been operating in the Albanian market for many years, focusing primarily on the import of agrochemicals. They supply the market with PPPs, microbial products, and other agricultural inputs. They are all micro businesses that employed between six and nine workers. Their annual turnover ranged from EUR 600,000 to EUR 1.6 million. The owners of the companies were all men. At the time of the interview, Agroinput Jazxhi employed four men and three women, whereas Agrimatco employed six men and three women, and Planta shpk employed six men.

The interviewed companies hired mainly through personal or professional networks, and to a lesser extent through media advertising, job fairs, or online job ad platforms. About 20% of the declared employees had secondary or vocational education while the rest had higher education. Companies had salary levels starting from ALL 45,000 to 70,000 (from EUR 395- 615) per month. They mentioned that these salaries were competitive in the Albanian market, given that they were almost the same as salaries in other companies in the sector.

At the time of data collection, the interviewed stakeholders were mainly involved in developing repackaging solutions for the imported products. They also engaged in agronomic consulting, soil analysis, and information activities about their products. They planned to invest in the expansion of their product range and the introduction of precision agriculture technologies. Main challenges they faced in Albania were the difficult socio-economic situation and the lack of competitiveness in export markets due to the high costs of raw materials.

Skills demand in the niche

There is no official data or research that can provide statistics in terms of both skills demand and skills supply in this niche. However, based on the interview data, faced with the lack of skilled workers in the agriculture, forestry, fisheries, and veterinary sciences sector, the niche is unequipped to deal with the influx of new technologies. In particular, the companies face the dual challenge of finding workers with up-to-date skills in operating new technological equipment and finding qualified workers, is slowing the niche development.

The interviewed companies stated that their staff was composed mainly of experienced professionals who were employed on a full-time basis. To help equip young professionals with the relevant skills, the companies offered internship programmes to support young professionals (further discussed in the skills supply section). The most needed occupations in the niche in Albania, according to the interviewees, were professionals in the agricultural sciences such as:

- agricultural engineers (ESCO 2144.1.2) for the management of agricultural inputs;
- hydro engineers (ESCO 2142.1.11 - water engineer) for the management of irrigation systems;
- (senior) agronomists (ESCO 2132.2);
- food technologists (ESCO 2145.1.4);
- chemical technologists (ESCO 2145.1 - chemical engineer);
- agroeconomics specialists (e.g. ESCO 2631.2 – economist, with additional knowledge in agriculture);

Additionally, the companies stressed importance of business support professionals, such as:

- financial managers (ESCO 1211.1);

- Sales and marketing managers (ISCO 1221).

The interviewed companies particularly underscored the declining number of well-prepared specialists in agriculture as one of the main challenges in the labour market.

Skills related to working in large teams were the most sought-after non-technical or soft skills identified in the interviews. However, the company interviewees expressed a marked preference for **technical** skills, such as knowledge on input usage for plants; detecting plant diseases; knowledge of the legal codes pertaining to the use of PPPs; skills and knowledge in cultivating plants, trees, and vineyards; ability to apply modern technologies for the purpose of plant protection and environmental protection; skills in good agricultural practices; environmental protection and ability to deploy non-harmful methods in the field; precision farming; and nature based production practices.

Based on these skills needs, it can be assumed that additional occupational profiles can be in demand among biochemical and microbials companies:

- agricultural scientist (ESCO 2132.1)
- soil scientist (2133.11)
- ecologist (2133.5)

Apart from the non-technical and technical skills, the interviewees also reflected on the skills they thought will matter in the future. They emphasised working with new technologies as one of the most important technical skills in the future, especially in precision agriculture. This follows the stakeholders' plans for development and expansion into the precision agriculture market and the inevitable influx of new technologies in the production biochemical and microbial inputs for agri-food sector.

Skills supply

Detailed information on the supply of skills relevant for the niche of biochemical and microbial products for agri-food in Albania is scarce. There has been a significant increase in recent years in the activity of vocational schools and professional training centres, as well as of non-public actors, in the development of training courses. However, there is no sufficient and detailed data regarding these courses, their types, and the specific skills that they equip students with. This is why the information presented further mostly relies on the perceptions of stakeholders revealed in the interviews.

As mentioned above, there are nine secondary **vocational education schools** relevant to the niche in the country. Among other subjects, they offer courses in chemical technology and food technology. As Table 10 shows, the number of students registered in secondary vocational school programmes in food technology and chemical technology was about 4.4% of the total number of registered students in vocational secondary education in 2021/2022. This indicates that these profiles are not popular in the country, especially when compared to other study areas.

The VET education was assessed by stakeholders as sufficient to provide for general skills relevant to the niche. However, issues such as lack of practical experience, outdated curricula, and old equipment due to the lack of financial resources all affect the quality of VET provision. In addition, VET students are not structurally encouraged to branch out of their own fields, meaning that there are low opportunities for interdisciplinary development in the VET system.

TABLE 10. NUMBER OF STUDENTS REGISTERED ACCORDING TO VOCATIONAL SCHOOL PROFILES (ISCED 4)

No.	Vocational School Profiles (2022)	No. of registered students	%
1	Hospitality - Tourism	3,212	19.5%
8	Food Technology	712	4.3%
9	Chemical Technology	13	0.1%
10	Other	9,703	59%
	TOTAL	16,441	

Source: National Agency of Employment and Skills (2021). Statistical Bulletin. Available here.

Based on the information gathered by education and training providers, the most relevant tertiary education programmes offered in the biochemical and microbial products are undergraduate programmes in agronomic engineering; professional programmes in seed and seedling production techniques; undergraduate and graduate programmes in plant protection sciences; undergraduate programmes in agronomy; and undergraduate and graduate programmes in biotechnology and food technology.

There are about eight **HEIs** in Albania that offer 27 programmes for competence and professional skills development that are at least to some extent relevant for the niche, although some of the programs offered do not directly serve the agricultural or agri-food sector (e.g. chemistry, biology). The AUT, meanwhile, does provide specialised programmes that are relevant to the niche. These programmes are presented in

Table 11 below.

TABLE 11. HEI PROGRAMMES AT ISCED LEVELS 5 AND 6 (PUBLIC UNIVERSITIES)

Public HEI (out of 13) 2022[62]				
No.	**HEI/Faculty**	**No.**	**Study Programme**	**Ac. Offer in number of quotas**
1	UNIVERSITY OF TIRANA Faculty of Natural Sciences	1	Biology	100
		2	Biotechnology	100
		3	Chemistry	100
		4	Food Chemistry and Technology	100
		5	Industrial and Environmental Chemistry	100
		6	Natural Environmental Science	100
2	LUIGJ GURAKUQI UNIVERSITY, SHKODER Faculty of Natural Sciences	7	Biology chemistry	55
3	ALEXANDER XHUVANI ELBASAN UNIVERSITY Faculty of Natural Sciences	8	Biology chemistry	80
4	ISMAIL QEMALI UNIVERSITY, VLORE Faculty of Technical Sciences	9	Biology	35
		10	Aquaculture and hygiene of fishery products	56
		11	Chemical Laboratory Technician	58
5	EQEREM CABEJ GJIROKASTR UNIVERSITY Faculty of Natural Sciences	12	Biology chemistry	15
6	UNIVERSITY FAN S. NOLI KORÇE Faculty of Agriculture	13	Agri-food	35
		14	Seed and Seedling Production Techniques	60
	Faculty of Natural Sciences and Humanities	15	Biology chemistry	30
7	AGRICULTURAL UNIVERSITY OF TIRANA Faculty of Biotechnology and Food	16	Agri-Food Engineering: Technology of alcoholic and non-alcoholic beverages	53
		17	Agri-food engineering profile: Food Technology	100
		18	Food and Nutrition Science	78
	Faculty of Agriculture and Environment	19	Agrobiology	30
		20	Agricultural Engineering profile: Marine Biology and Aquaculture	20
		21	Agrarian engineering profile: Plant protection	50
		22	Agri-Environmental Engineering	100
		23	Environmental Science profile: Natural Resource Management	70
		24	Agricultural Technologist	50
		25	Technologies of Aquaculture and Fishing	30
8	WESTERN BALKANS UNIVERSITY Faculty of Medical Laboratory Sciences and Imaging	26	Laboratory Technician	N/A
		27	Biotechnology	N/A
8	TOTAL	27		1505

According to the interviewed companies, VET and higher education systems do offer sufficient knowledge to satisfy the basic level of demand for general skills in the fields such as food technology, agronomy, and biotechnology. However, there is a lack of training in innovative methods of production, which reflects the generally low demand for biochemical and microbial products in Albania. Therefore, the companies themselves engage of the provision of this knowledge for their employees.

The company representatives interviewed for this study emphasised the importance of **on-the-job training**. According to them, recent graduates need about three to six months to adapt to working

[62] UAlbania Portal Data, 2022. Available here.

conditions. The companies offered ongoing training, mostly short-term, and seminars with the help of the experienced staff. The businesses trained the employees in skills such as plant protection, biotechnology, and food safety. In special cases, they offered short-term training courses to employees abroad in companies that they cooperated with. Unfortunately, the information on which specific partners they cooperated with, and the types of training courses offered, was not available.

Employee training was carried out for almost all employed staff and at all levels of employment. Specific training programmes were designed to meet the companies' needs, they were flexible and without additional fees. The company interviewees stated that they also provided opportunities for career development within the company.

The education and training providers interviewed also emphasised that they develop short-term trainings with businesses in their premises but also in the premises of the included institutions which are regularly announced through the official website and media. Cooperation in the niche takes the form of joint workshops, conferences and implementation of joint projects.

The interviewed companies further stressed that they did not monitor the skills demand. For example, they did not participate in surveys or other assessments about skills needs. They estimated that educational institutions prepare specialists with appropriately for the labour market, thereby suggesting that any other skills can be developed on the job.

Finally, companies importing and selling the chemical products for agri-food from abroad play an important additional role in educating agricultural holdings about the use of such products.

Matching the demand and supply

The balance between skills supply and demand related to the niche of biochemical and microbial products for agri-food seems to be sustainable in Albania because it can satisfy the general skills required by the companies that import and distribute these products in the country. However, several challenges that were outlined above persist. They indicate that the current provision of skills in the country is not sufficient to provide for inter-disciplinary skills necessary for the further development of the niche. The foregoing conclusion relates primarily to VET and institutions of higher education. As discussed, these provide rather general education to students and do not equip them with the necessary practical skills.

The cooperation of education providers with businesses is carried out through formal agreements, as well as via the involvement of experts from these institutions. However, such activities of the education providers are limited in scope, mainly due to modest financial support and negligible resources, as well as lack of modern laboratory equipment. In addition, the niche of biochemical and microbial products for agri-food is not specifically covered by such activities.

Furthermore, the interviewed companies expected a large skill shortage in both the short and long-term for specialists in agronomy, agriculture, and agrarian economics due to the low popularity of these study programmes. The expected shortage is visible in the downward trend of enrolment in agriculture in Albania and the general challenges that the agri-food sector faces, which were outlined in the Overview chapter. Hence, the companies encourage employees to develop new skills through trainings on-the-job and provides by the employers. On-the-job training and formal training will remain the most important ways of satisfying skills demand in Albania in the short and medium-term.

ORGANIC AND FUNCTIONAL FOODS

Organic farming is a method of farming that respects the natural life cycles. Organic regulations tend to prohibit the use of harmful substances in food production, such as artificial fertilisers, types of PPPs (e.g. pesticides and insecticides) and food additives. Functional foods, also known as nutraceuticals, are highly nutritious foods or food supplements that carry health benefits for consumers. These health benefits include, but are not limited to, disease protection, promotion of proper development and overall health balance.

The organic and functional foods niche in the agri-food value chain can operate on all the levels of the supply chain. However, due to the study framework, in this chapter we focus on the production and processing levels of the value chain.

This niche is covered by the following NACE sectors:

- Growing of non-perennial crops (A1.1)
- Growing of perennial crops (A1.2)
- Manufacture of food products (C10)
    - Manufacture of other food products (C10.8.9)
- Manufacture of beverages (C11)

Organic and functional foods niche is involved in the production of a wide range of goods. In Albania, the production in the niche mainly focuses on medicinal and aromatic plants (MAPs), with the potential to expand the production of wild organic products, such as chestnuts and other organic and functional foods. The share of land designated for organic farming in Albania remains low, although it has started increasing in recent years.

Overall, the organic agriculture activities in Albania remain small-scale and largely informal, which leads to a lack of good data. This is even more pronounced in the functional foods segment of the niche, on which information is especially scarce.

This chapter begins by presenting an overview of the general profile of the niche of organic and functional foods in Albania based on the available data. Then, we discuss the skills demand and supply for the niche. In addition, we present what programmes, tools, and activities that are available in Albania to match the demand and supply in the niche.

The profile of the market niche

General context

Organic and functional foods in Albania are becoming increasingly popular. Albanian citizens are becoming more aware of the benefits of a healthy and organic diet that is grown without the use of PPPs, such as pesticides, or chemical fertilisers. Indeed, the growth of the organic sector is also seen as important for providing opportunities in Albania’s rural areas, which are suffering emigration rates and low economic productivity.

There are notable indicators depicting the growth of the niche in the country. According to the FiBL & IFOAM data from The World of Organic Agriculture survey (2023), the organic share of agricultural land in Albania was only 0.09%,[63] despite a notable trend of increase. Table 12 shows that the land for organic production in Albania increased from 549 ha in 2017 to 1,094 ha in 2021, or by 52%. shows the growth of organic land between 2017 and 2021.

TABLE 12. DEVELOPMENT OF ORGANIC AGRICULTURAL LAND, IN HA

Year	2017	2018	2019	2020	2021
Value in ha	549	747	653	887	1,094

Source: FiBL (2023). The world of organic agriculture. Available here.

If collection of wild products were considered as part of organic land, according to MARD, then these numbers might even be higher. For instance, based on the available data, there is an important chestnut massif of 2,545 ha in the Kukës and Shkoder regions (2,000 ha and with about 18,500 roots Tropoja/ Kukes and 545 ha Malsia e Madhe/ Shkoder). The massif is important for chestnuts and wild organic production in general. The estimated production in both areas reaches about 2,260-2,350 tons, which suggests that the organic surface in Albania could be significantly higher than officially estimated.[64]

According to FiBL's survey, there were 130 organic producers and 62 processors in the country in 2021[65] (see Table 13). While data on imports of organic foods to Albania is not available, Albania mostly focuses on exports its organic products, with 50% of exports going to Italy. In addition to this, some of the large US, German, Turkish, and French processing companies are Albanian exporters' primary buyers.[66] The EU has also been importing more of Albanian organic agri-food products. For example, in 2020, the EU imported 1,825 metric tonnes (MT) of Albanian organic agri-food products and 1,970 MT in 2021.[67]

TABLE 13. ORGANIC PRODUCERS AND OTHER OPERATORS ON THE COUNTRY LEVEL

Year	Producers	Processors	Exporters	Importers
2021	130	62	26	N/a

Source: FiBL (2023). The world of organic agriculture. p. 56 Available here.

Table 14 shows the change in the number of organic operators in the country in the recent years,[68] which generally indicates growth of the niche in Albania in the past two decades. The number of

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[63] FiBL, 2023.The world of organic agriculture. p.43. Available here. See also FiBL 2019. The world of organic agriculture. p. 50. Available here. FiBL, 2021.The world of organic agriculture. p.43. Available here.

[64] MADA/MMP-AFDCZZ1635.01C/CS/RMD, AUT, March 2015-September 2016. Development of the value chain for chestnuts and chestnut honey in the area of Rec, Tropoje and the surrounding area. See also
TABLE 32 in Annex showing the production of wild organic products in Albania.

[65] FiBL (2023). The world of organic agriculture. p. 56. Available here.

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

[67] European Commission (2021). EU Imports of organic agri-food products. p. 8. Available here.

[68]

TABLE 31 in Annex shows the number of organic farms by activity in Albania.

producers has been fluctuating, but overall, it has increased notably in the period of 2006-2019 (from 30 to 86). In addition to that, we see a strong rise in processors until 2018, and then a sudden drop in 2019. The number of exporters has also grown, although it has marked a slight decrease in 2019.

TABLE 14. NUMBER OF CERTIFIED ORGANIC OPERATORS IN ALBANIA BY CATEGORY AND YEARS

	2006	2007	2008	2009	2010	2014	2018	2019	2020	2021
Producers	30	40	43	31	110	61	82	86	N/a	130
Processor	3	3	4	5	25	53	58	8	N/a	62
Importer	N/a	N/a	N/a	N/a	N/a	4	4	N/a	N/a	N/a
Exporter	2	2	4	7	18	25	30	25	NA	26
Total	35	45	51	43	153	143	174	119	N/a	218

Source: FiBL (2021). The world of organic agriculture. Available here.
Note: An operator may belong to more than one category.

According to the previous studies, there were up to 100,000 people that were directly or indirectly receiving income from the organic sector in 2016; about 20,000 households were engaged in the collection of medicinal and aromatic plants (MAPs), and about 4,000 – in cultivation.[69] Qualitative data collected for this study suggest that the number of farmers engaged in cultivation is growing, while the number of harvesters, at least in some rural areas, is shrinking.

Overall, however, although the number of organic farms in the country is small, this might not reflect the actual situation. Many people active in the niche use the mountain areas and alpine pastures for harvesting uncultivated medicinal plants, informally. There is no reliable data concerning the current number of harvesters or growers.

Albania is amenable to the production of many different varieties of organic foods due to its Mediterranean climate. The country has a long tradition of winemaking, and posts strong numbers, relative to the size of the sector, in the production of olives, fruits (chestnuts, forest fruits), and the development of orchards. However, the production of organic and functional foods is very homogenised, with MAPs dominating the sector. As illustrated in Table 15, MAPs make up around 85% of the total organic production in Albania.

TABLE 15. AREA WITH ORGANIC AND FUNCTIONAL FOOD PRODUCTION IN TERMS OF AGRICULTURAL LAND, 2021

[69] MARD (2021). MAP Sector Study. Available here.; Imami et al. (2021). MAPs Sector Study. Available here.

Description	Area Ha			
	Total	**in conversion process**	**organic area**	**of which in greenhouses**
Arable land	952.3	83.1	869.3	4.4
- *Medicinal and aromatic plants*[70]	*926*	*80*	*846.2*	*2.0*
- *Vegetables*	*16.5*	*1*	*15.6*	*2.4*
- *Forage*	*8.2*	*1*	*7.4*	
- *Others*	*1.7*	*1.6*	*0*	
Orchards	144.7	101.3	43.4	0.3
Fruit trees	34.3	26	8.3	0.3
Olives	95	60.6	34.2	
Vineyards	15.6	15	0.9	
Total	**1,241.9**	**286**	**922**	**5**

Source: INSTAT (2021). Statistical yearbook. Available here.

MAPs production has a long tradition in Albania, with over five decades of production. MAPs are an important source of revenue for many rural households, particularly in the mountainous areas. There are no specific figures about the number of rural households involved in MAPs income earning activities. Two 2010 surveys estimated that over 25% of the households in mountain areas were involved in MAPs harvesting and cultivation, with an estimated 20,000 households were engaged in MAPs collection, as mentioned above.[71] MARD indicates that this number has decreased in the last decade, without providing any new numbers.[72]

Relative to other agricultural subs–sectors, MAPs sub-sector is predominantly export-oriented, as 95% of total MAPs are exported, contributing to around 20% of total agricultural exports.[73] It provides income to about 80,000 households, which are involved in the entire value chain.[74] Export of MAPs has increased three-fold since 2010, reaching more than EUR 33 million in 2019, while the export of essential oils extracted from MAPs has increased twelvefold, reaching EUR 4.6 million.[75] According to sector associations, the volume of international trade stands at around EUR 50 million per year. As of 2020, Albania ranked 16th at the world level in terms of MAPs exports.[76]

Workers in the niche are predominantly unqualified workers. This is largely due to the nature of the niche in Albania, which is dominated by MAPs, the production of which is steeped in traditional knowledge, rural life, and family structures, as we discuss further below.

Key stakeholders

MARD is the ministry in charge of overseeing the organic and functional food production in Albania. Organic production in Albania is legally codified according to the law No. 106/2016 “On biological production, labelling of biological products and their control”. Its focus is to create the basis for the

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[70] Culinary plants and spices included.

[71] MARD (2021). MAP Sector Study. p. 6. Available here.

[72] MARD (2021). MAP Sector Study. p. 6. Available here.

[73] AASF (2019). Available here.

[74] AASF (2019). Available here.

[75] Eurostat (2020). International Trade in Goods. Available here.

[76] Eurostat (2020). International Trade in Goods. Available here.

sustainable development of biological production and to ensure the efficient operation of the market and protect the interests of consumers.

Both international and local certification bodies operate in the country.[77] Certification bodies are accredited by General Directorate of Accreditation (DPA), the national accreditation body. For example, Bio.inspecta is an international certification body active in Albania. Bio.inspecta integrated Albania's first national certification body, Albinspekt, into its organisational structure in 2017.[78]

In general, since the niche is very small, there are low levels of support. The ecosystem of stakeholders in this niche is also very limited. There are no specialised intermediary bodies, while the support for skills development in the niche usually comes as part of the general support for agri-food sector companies.

Companies representing the niche

As part of this study, we interviewed the representatives of three companies engaged in production of organic foods in Albania: Musaj Olive Oil shpk., Hojeza shpk., and Alb Calystan shpk. The three limited liability companies had been operating in the Albanian market for over 25 years. They mainly focused their operations on partial or complete processing of primary products, standardisation, packaging, and extraction of oil essences from MAPs.

- Alb Calystan specialised in cultivation of herbs and spices, and production of essential oils. At the time of data collection, it was the largest of the interviewed companies and employed around 60 people, with an even gender split. Most employees had secondary education, and some were educated at tertiary levels, mainly in various production-related occupations, chemistry, and management.
- Hojeza engaged in honey production and processing. At the time of data collection, it employed four people, with an even gender split. Hojeza's employees were educated at higher levels, mainly in engineering, installation and maintenance, and administration.
- Musaj Olive Oil specialised in olive oil production. At the time of the interview, it employed eight workers, six men and two women, all of whom were educated at higher levels, mainly in marketing, accountancy, and agri-food technologies.

All three companies confirmed that they hired on a permanent basis, with full-time contracts. They found employees mainly through personal acquaintances and the network they had, and, to a lesser extent, through public announcements.

All three interviewed companies were exporters. The main areas for export were Kosovo, other the countries of the region, as well as the USA, Canada, and Australia. Regarding the plans in the medium term, the interviewed stakeholders planned to invest mainly in machinery for increasing production capacities and improving standards. The interviewed stakeholders emphasised that future investments

[77] Ministry of Agriculture and Rural Development of Albania. Organic Production. Available here.

[78] Bio.inspecta. Available here.

in processing machinery would mean that machine-operating skills will become more prominent in the niche. This will drive the demand for specific skills.

The main challenges of operating in the niche in Albania identified by the companies included in the interviews were achieving standards for target markets; need for support for business expansion; product certification; and increasing costs of raw material.

Skills demand in the niche

As mentioned above, just as the agriculture sector in general, the market niche of organic and functional foods suffers from high levels of informality. This results in a lack of official data on the jobs offered in the subsector. However, specific conclusions can be drawn based from the desk research and the interviews with relevant stakeholders.

The interviewed companies could not comment on the current skills needs, as their demand was well-satisfied. They argued that their staff was experienced and well-equipped for the work required. Nevertheless, the interviews focused on the future and likely demand of new skills in the short term. Overall, the skills that the companies listed as increasingly important for the production of organic foods, could be grouped into several categories:

- Agriculture and agronomics, with specific focus on organic production (e.g., practices of organic food production, technical and technological skills for the processing of organic products, especially aromatic and medicinal plants; practices of organic farming and relevant farming procedures).
- Standards, certification and labelling of organic products (e.g., knowledge of quality labels of organic products such as protection of origin, indicators of origin and brand protection rules, knowledge of legal standards related to organic farming and organic products
- Skills for work in modernised holdings of organic agriculture (e.g., IT skills, smart agriculture)

Based on these skills needs, broader ESCO occupational profiles with matching skills and knowledge areas include (but are not limited to):[79]

- 2132.1 - agricultural scientist
- 2132.2 - agronomist
- 2133.11 - soil scientist
- 6130.1 - farm manager

All interviewed companies emphasised that the skills acquired through traditional ways of doing organic farming will become obsolete in the future, while digital and technological skills will become more important. All the stakeholders also emphasised that finding specialised workers is likely to become a challenge. Modernisation of the processing and production capacities will determine a new demand for technical skills, such as operating machinery and work with new (digital) technologies. The representatives of the three companies agreed that there will be a shortage of IT skills for the niche in

[79] Based the ESCO classification of Skills, Competences and Occupations. Available here.

both the short and the long-term. This is primarily due to the waning interest of young people to be involved in agriculture or related activities.

Only one of the three interviewed businesses declared that they benefited from financial support from the Agency for Agricultural and Rural Development. The companies declared that they constantly participated in different surveys related to skills demand and assessments about skills needs through cooperation with international organisations, mainly FAO and German Agency for International Cooperation (GIZ).

Skills supply

While, as outlined earlier in the report, there are numerous programmes providing education in agri-food at various levels of education, the supply of skills specific to the production of organic and functional food in Albania is limited.

Two main **HEIs** in Albania offer programmes relevant for the organic and functional foods niche. These are the University Fan S. Noli of Korçe and the AUT. They provide professional competences and skills in this niche through programmes such as seed and seedling production techniques and agricultural business management at the University Fan S. Noli; and food and nutrition science, agri-food engineering, and technology of alcoholic and non-alcoholic beverages at the AUT. The graduates of these study programs are mainly oriented towards businesses in the agri-food sector, at technical and managerial levels. Based on the collected data, there is a decreasing trend in the number of students attending these study programs, which corresponds to decreasing trends in agri-food in general.

Education and training representatives argued that academic professionals employed at their institutions are continuously working on updating their knowledge on emerging issues in their area of expertise. Academic staff develop their skills mainly through cooperation with other education and training providers, companies, and business in the field, through projects, consultancy, joint conferences as well as research among experts in similar fields. There is a gap in available information on specific programmes and attendance numbers.

While numerous VET programmes in occupations related to agri-food are available in Albania (as outlines above), the **VET level** education for the niche or organics and functional foods specifically is almost non-existent. In general, the companies argued that there is little evidence of any concrete steps of the VET sector to address the needs of the MAPs industry and the niche more generally.

Short-term training courses are offered by public and private (licensed) training centres. Public training providers offer courses lasting up to five months. Short-term courses focusing on the agriculture sector are not popular. However, new curricula relevant for the niche of organic and functional foods production have been developed lately. For instance, trainings on "dairy processing," "mountain fruits collection, cultivation and processing," "MAPs collection, cultivation, and processing". were financed by "Fuqi Punëtore e Shkathët për Integrim Ekonomik – SWEI.[80] According to interviews, these organisations play an important role in organic production and research by incentivising farmers to shift

[80] Employment Promotion Agency of Kosovo. Available here. SWEI was a project financed by the European Union and managed by the Office of the Delegation of the European Union in Albania (2018-2020) that supported training young people in the region around the Albania-Kosovo border.

towards organic farming; offering assistance in the fields of plant production technology to ensure a more sustainable agriculture; support in contemporary techniques and certification practices.

On-the-job education is very important in the niche, as emphasised by the interviewed companies. They usually provided training independently. However, they also cooperated with the National Employment Agency, state agencies and institutions or organisations that offer training, such as the AUT, or professional training centres. The training programmes were short-term and were mainly related to developing technical skills for using machines and equipment and knowledge in processing standards. Furthermore, the companies also welcomed students for several months of temporary work as part of professional internship schemes. The companies did not cooperate with trade unions or social partners in relation to skills development.

The main contribution of **business intermediary bodie**s to the niche is the provision of continuous training, mainly in matters related to certification and standards for organic production. Business intermediary bodies also offer support through training in environmental protection, good agricultural practices and new technologies. However, most of the training is generally aimed to agri-food sector in general rather that the niche specifically. In addition, the stakeholders emphasised that while trainings take place, their provision was uncoordinated and asymmetric, thus reflecting a high degree of knowledge dispersion in the niche. Some of the main areas of targeted training we in human and financial resources management; marketing; and new techniques and practices in entrepreneurship. These sessions were published and promoted mainly through the web or in the media. Unfortunately, we could not find more specific information on other types of skills provided through business intermediaries, thus suggesting a gap in skills provision.

Matching the demand and supply

Considering the trends of recent years, such as the increase in the size of organic farms, companies, and farm activity, the need for qualified workers specialised in organic agriculture is likely to increase.

While there is an increasing demand for low-skill workers, mainly in activities related to primary agricultural production (cultivation, harvesting, collection, etc.) which largely fall under the ISCO group 9 – Elementary occupations, there is an insufficiency of the supply, which is related to demographic problems (population displacement towards urban markets or emigration), as well as the tendency for non-involvement in rural activities. This phenomenon is less noticeable in the areas where the processing industry is installed.

Low levels of enrolment in agricultural and food-related educational programmes are also evident, combined with low levels of vacancies, which is related to the sector's informality.

Considering the above, it should be noted that there is a mismatch between the skills supplied to the market and the skills demanded in the market. Educational programmes relevant to the niche exist at both VET and higher education levels. However, they are broad in nature and do not focus on the niche of organic and functional production specifically. The lack of practical training of the graduates, reflected in particular in the lack of internship opportunities, general education and dispersed skills supply system points to a low-skilled workforce in the niche.

In addition, the niche is not very popular with younger people. Though the decrease in popularity affects the agri-food sector in general, the niche is specifically affected because it is perceived as a traditional activity done by older and less educated people. Therefore, attracting younger labour force is a major challenge.

CONCLUSIONS

Agri-food represents a significant share of Albania's GDP. Significant shares of Albanian of rural populations earn a living in agriculture. This means that modernising rural and agricultural infrastructure, production and processing and diversifying rural economic activities will remain important for Albania's future development.

Agri-food sector in Albania is still relatively underdeveloped. Various problems persist, such as digital rural vs. urban divide, food safety issues, low enrolment of students in secondary and higher education, small and dispersed farms that are usually family-owned, high informalities and gender gaps. Just like the agri-food sector generally, its specific niches that were the focus of this study are affected by similar problems. The three niches of digitalisation for agri-food, biochemical and microbial products, and organic and functional foods are also at the very early stages of development.

Digitalisation in agriculture and food processing in Albania is underdeveloped. There are several reasons for this, mostly related to the insufficient technological and physical Internet infrastructure in the rural areas, low demand for digital innovations in agri-food, and the lack of digital skills in the sector. Due to demographic changes (mainly, the young people abandonment of rural areas) as well as emigration, the age of employees involved in agricultural activities constitutes a barrier to the use of digital technologies. Albania is experiencing a rapid growth in the number of companies in the digital sector (e.g. programming, ICT), however the collaboration between these companies and the agri-food producers is virtually non-existent. Partly, the problem is due to the structure and the size of enterprises in agri-food field in general, and of agricultural farms. An important factor to mention is also the salary gap between the employees that work in agri-food and ICT.

Companies that could represent the niche in Albania usually apply digital solutions to agri-food, rather than develop them. They are usually small companies working in e-commerce, pricing and market information, and education. The interviewed companies were both formed as part of international projects and collaborations. They wished to expand their services but faced financial constraints.

Generally, there seems to be a mismatch, related to the speed, different direction of activities and lack of coordination between the movement of providers of digital skills in the agri-food sector (institutions of higher and secondary education) and the dynamics of the labour market, which is changing rapidly. Considering the current situation, a coordinated effort of the government, educational institutions and main business stakeholders is needed. It should focus on developing mechanisms for financial support and guidance of young people to acquire digital skills.

Development and production of **biochemical and microbial** inputs for agri-food does not take place in Albania. This market niche is dominated by import activities of agricultural inputs. Apart from retail and import, partial processing and packaging are becoming more prevalent, though to a limited extent.

The production **of organic and functional products** occupies a very small portion of the total agri-food sector in Albania. The information on functional foods production is very limited and there are also limitations to available information on organic food production. However, the market niche has growth potential in Albania, primarily due to its natural capacities and traditions. The interviewed companies mainly apply basic technologies to their operations. However, they have interest in expanding their operations and upgrading their equipment.

Companies across all three niches have reported the lack of financial resources and investments, low demand, small market size and low salaries in the niche as some main challenges. There are gaps in skills related to technical agriculture and food processing skills, as well as skills not linked specifically to agri-food, such as IT, digital marketing and sales.

There are efforts in the vocational secondary education system as well as higher education institutions to align the curricula to the demands of the labour market. These efforts are reflected by the number and nature of the study programs, which are generally relevant, especially for the biochemical and microbial, and organic and functional foods niche. Nevertheless, Albania still lacks a strong cross-sectoral strategy to connect the state institutions, chambers of commerce, business associations and universities, in order to develop a clear plan, information, training, and financial support the three niches and the agri-food sector more generally. Support schemes for the development of human capital and increasing access to finance for businesses should also be built.

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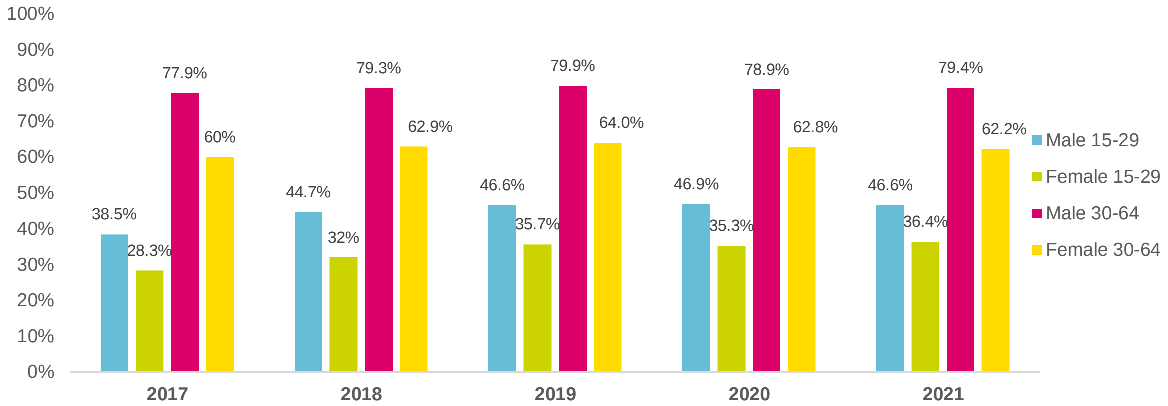
THE LIST OF INTERVIEWEES

No.	Stakeholder type	Organisation	Date of the interview
1	Business	ABA Online	30/11/2022
2	Business	Misfruit	30/11/2022
3	Business	Agrimatco	06/12/2022
4	Business	Agroinput Jazxhi	13/12/2022
5	Business	Planta.shpk	29/11/2022
6	Business	Alb Calystan	05/12/2022
7	Business	Alb-tech	N/A
8	Business	Hojeza	22/11/2022
9	Business	MUSAJ OLIVE OIL SHPK	02/12/2022
10	Business intermediary	SME Albania	02/12/2022
11	Business intermediary	Albanian Agribusiness Council (AAC)	05/12/2022
12	Business intermediary	CCIT Tirana	08/12/2022
13	Public sector	Ministry of Agriculture and Rural Development	10/12/2022
14	Public sector	National Agency for Scientific Research and Innovation (NASRI)	06/12/2022
15	Public sector	Regional Agricultural Extension Agency Korcë	06/12/2022
16	Education and training providers	Agricultural University of Tirana	24/11/2022
17	Education and training providers	Research and Teach. Group, Business Informatics (Faculty of Economy and Agribusines)	06/12/2022
18	Education and training providers	Faculty of Agriculture, UNIKO	02/12/2022
19	Education and training providers	Irisoft	28/11/2022
20	Education and training providers	Institute of economic studies and knowledge transfer	21/11/2022

ANNEX

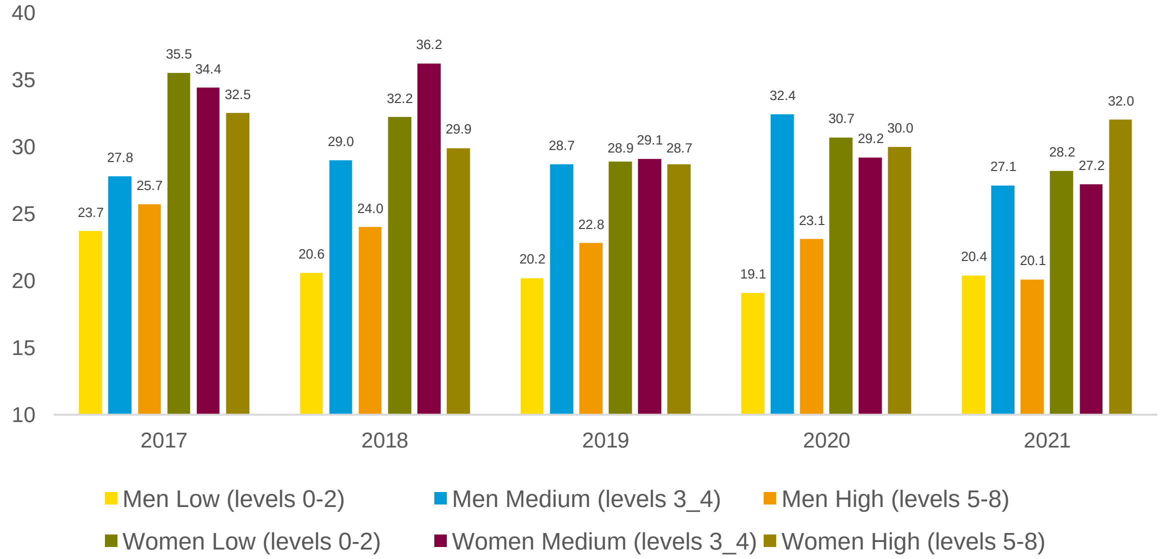
Labour market in Albania

FIGURE 9. EMPLOYMENT RATE BY AGE, SEX IN TOTAL



Source: INSTAT, The Labour Force Survey (LFS) (2017-2021). Employment Rate 2021. Available here.

FIGURE 10. YOUNG PEOPLE NEITHER IN EMPLOYMENT NOR IN EDUCATION AND TRAINING BY SEX AND EDUCATION LEVEL (ISCED) AND YEAR



Source: INSTAT (2021). Available here.

TABLE 16. EMPLOYMENT STRUCTURE IN AGRICULTURE BY PREFECTURES

Prefectures/Years	2017	2018	2019	2020	2021
Kukës	60%	64%	68%	72%	70%
Elbasan	64%	67%	64%	62%	62%
Dibër	59%	59%	58%	65%	61%
Berat	54%	61%	62%	64%	58%

Prefectures/Years	2017	2018	2019	2020	2021
Korçë	53%	53%	53%	57%	57%
Fier	62%	60%	56%	60%	55%
Gjirokastër	44%	40%	50%	55%	51%
Shkodër	46%	46%	45%	44%	44%
Lezhë	42%	3%	29%	23%	25%
Vlorë	28%	35%	34%	28%	23%
Durrës	17%	14%	13%	13%	14%
Tiranë	6%	7%	7%	7%	5%

Source: INSTAT. Employment and unemployment from LFS. Available here.

TABLE 17. GROSS AVERAGE MONTHLY WAGE PER EMPLOYEE BY ECONOMIC ACTIVITIES AND SEX (IN ALL)

No	Economic activity according to NACE Rev2	Total		Men		Women	
		2020	2021	2020	2021	2020	2021
1	Total	53,662	57,191	55,317	58,413	51,679	55,760
2	Agriculture, forestry and fishing	33,359	35,661	34,039	36,400	31,941	34,150
3	Mining and quarrying; manufacturing; electricity, gas, steam and air conditioning supply; water supply; sewerage, waste management and remediation activities	45,359	48,860	53,713	57,297	36,598	40,447
4	Construction	41,629	43,358	41,240	42,668	43,676	46,840
5	Wholesale and retail trade; repair of motor vehicles and motorcycles; transportation and storage; accommodation and food service activities	39,870	43,770	41,297	45,398	37,586	41,288
6	Information and communication	80,626	86,353	85,250	91,126	74,746	80,579
7	Financial and insurance activities	109,423	113,235	119,952	125,890	102,882	105,532
8	Real estate activities; Professional, scientific and technical activities; administrative and support service activities	60,925	62,960	61,421	63,302	59,908	62,286
9	Public administration and defence; compulsory social security; education; human health and social work activities	64,483	68,924	69,639	72,734	60,653	66,130

Source: INSTAT's calculation (2021). General Directorate of Taxation, social insurance contributors. Available here.

TABLE 18. GENDER PAY GAP BY OCCUPATION GROUPS

Occupation groups according to ISCO-08	2017	2018	2019	2020	2021
Total	10.5%	10.7%	10.1%	6.6%	4.5%
Managers, Lawmakers, Senior civil servants and Executive directors	0.2%	0.9%	-1.5%	-2.6%	-2.6%
Professionals	22.8%	21.7%	20.8%	18.3%	15.1%
Technicians and Associate Professionals	10.8%	12.8%	17.1%	12.4%	8.0%
Clerical Support Workers	-1.4%	-2.2%	5.2%	5.1%	4.8%
Services and Sales Workers	20.4%	21.4%	23.2%	24.2%	23.3%
Skilled Agricultural, Forestry and Fishery Workers	7.1%	7.8%	7.0%	9.7%	7.7%
Craft and Related Trades Workers	27.9%	27.0%	24.2%	22.9%	19.5%
Plant and Machine Operators, and Assemblers	29.1%	27.4%	24.2%	23.1%	18.8%
Elementary Occupations Armed Forces Occupations	7.1%	8.2%	7.5%	6.2%	4.9%
Armed Forces Occupations	0.0%	2.3%	3.0%	2.5%	5.1%

Source: INSTAT's calculation (2021). General Directorate of Taxation, social insurance contributors. Available here.

TABLE 19. GENDER PAY GAP BY ECONOMIC ACTIVITY

Economic activity according to NACE Rev2	2017	2018	2019	2020	2021
Total	10.5%	10.7%	10.1%	6.6%	4.5%
Agriculture, forestry and fishing	7.7%	5.4%	7.1%	6.2%	6.2%
Mining and quarrying; manufacturing; electricity, gas, steam and air conditioning supply; water supply; sewerage, waste management and remediation activities	35.3%	35.1%	34.6%	31.9%	29.4%
Construction	14.0%	10.6%	0.7%	-5.9%	-9.8%
Wholesale and retail trade; repair of motor vehicles and motorcycles; transportation and storage; accommodation and food service activities	10.6%	10.4%	10.2%	9.0%	9.1%
Information and communication	14.7%	16.6%	14.3%	12.3%	11.6%
Financial and insurance activities	17.8%	20.1%	15.1%	14.2%	16.2%
Real estate activities; Professional, scientific and technical activities; administrative and support service activities	5.6%	6.3%	6.8%	2.5%	1.6%
Public administration and defence; compulsory social security; education; human health and social work activities	13.7%	13.6%	13.6%	12.9%	9.1%
Arts, entertainment and recreation, repair of household goods and other services	-9.3%	-9.3%	6.9%	0.4%	-1.4%

Source: INSTAT's calculation (2021). General Directorate of Taxation, social insurance contributors. Available here.

TABLE 20. EMPLOYMENT STRUCTURE BY SEX AND ECONOMIC ACTIVITY (NACE REV.2)

Gender	Economic activity	2020	2021
Total	Total (number)	1,243,343	1,248,749
	Agriculture	36.1	33.8
	Manufacturing	11.2	11.2

Gender	Economic activity	2020	2021
	Construction	7	8.1
	Mining and quarrying; Electricity, gas and water supply	2.3	2.6
	Trade, Transportation, Accommodation and Food, and Business and Administrative Services	27.2	26.6
	Public Administration, Community, Social and other Services and Activities	16.2	17.7
Men	Total (number)	689,666	693,314
	Agriculture	31.8	28.8
	Manufacturing	8.8	9.4
	Construction	12.2	14.2
	Mining and quarrying; Electricity, gas and water supply	3.3	4
	Trade, Transportation, Accommodation and Food, and Business and Administrative Services	31.7	30.1
	Public Administration, Community, Social and other Services and Activities	12.2	13.6
Women	Total (number)	553,677	555,435
	Agriculture	41.4	40
	Manufacturing	14.1	13.5
	Construction	0.6	0.5
	Mining and quarrying; Electricity, gas and water supply	1.1	0.9
	Trade, Transportation, Accommodation and Food, and Business and Administrative Services	21.6	22.3
	Public Administration, Community, Social and other Services and Activities	21.2	22.9
Total	Informal employment in non- agricultural sector	29.1	29.4

Source: Labour Market, INSTAT LFS, 2021 (Source: Labour Force Survey, 2020-2021). Available here.

TABLE 21. UNEMPLOYED JOB SEEKERS REGISTERED ACCORDING TO THE MAIN PROFESSIONAL CATEGORIES (ISCO)

No.	Professional categories	Unemployed job seekers
1	Elementary Occupations	31.5%
2	Without a profession	19.6%
3	Managers	0.2%
4	Higher Education Specialists	7.8%
5	Armed Forces Occupations	0.1%
6	Employee in Industry	5.4%
7	Clerical Support Workers	2.8%
8	Sales and service employees	10.2%
9	Skilled Agricultural, Forestry and Fishery Workers	2.4%
10	Craftsmen, artisans, and related professions	15.8%
11	Technicians and Associate Professionals	4.3%

Source: National Agency of Employment and Skills, Statistical Bulletin (2021). Available here.

TABLE 22. UNEMPLOYED JOB SEEKERS REGISTERED ACCORDING TO PROFESSIONS AND REGIONS (%)

Profession/ Regions	Skilled agricultural, forestry and fishing workers	Craftsmen, artisans, and related professions	Technicians and Associate Professionals
Berat	17.4	0.1	3.3
Dibër	6.7	1.2	3.8
Durrës	13.6	0.8	4.1
Elbasan	31.8	6.1	9.2
Fier	14.1	1.6	3.2

Profession/ Regions	Skilled agricultural, forestry and fishing workers	Craftsmen, artisans, and related professions	Technicians and Associate Professionals
Gjirokastër	15	1.8	2.3
Korçë	10.1	0.7	1.8
Kukës	9.4	0.5	3.8
Lezhë	17.1	2.4	2.3
Shkodër	22.1	8.0	3.1
Tiranë	13.5	1.3	6.2
Vlorë	14.4	1.1	2.6

Source: National Agency of Employment and Skills, Statistical Bulletin (2021). Available here.

TABLE 23. UNEMPLOYED JOB SEEKERS REGISTERED ACCORDING TO THE PROFESSIONAL CATEGORIES AND GENDER

Professional categories	Total (%)	Women
Higher Education Specialists	7.82%	8.77%
Information and communication technology (ICT)	0.9%	0.78%
Technicians and Associate Professionals	4.27%	4%
ICT	1.1%	1.45%
Skilled Agricultural, Forestry and Fishery Workers	2.36%	2.23%
Qualified agricultural workers for the market	1.88%	1.75%
Qualified forest workers, fishing, hunter, trap setter	0%	0%
Producer of agricultural, livestock and fishing products	0.47%	0.48%
Craftsmen, artisans and related professions	15.77%	12.44
Food, wood, textile processing workers, etc.	6.2%	8.88%
Elementary professions	31.49%	33.28%
Agricultural worker, forestry and fishing	3.54%	4.12%
Food preparation assistant	2.13%	2.84%

Source: National Agency of Employment and Skills, 2022.

TABLE 24. REGISTERED JOBSEEKERS BY SEX, EDUCATION LEVEL AND AGE GROUP

Description	2017	2018	2019	2020	2021
Registered jobseekers	89,780	74,686	70,930	82,921	87,419
Gender					
Men	42,386	35,535	33,702	39,274	42,294
Women	47,394	39,151	37,228	43,647	45,125
Education level					
With primary education	50,250	42,676	39,582	46,420	48,752
With secondary education	34,260	27,102	26,062	29,803	30,834
With university education	5,270	4,908	5,286	6,698	7,833
Age group					
16-19 years old	2,096	1,575	2,279	2,660	2,357
21-34 years old	23,148	18,650	18,594	23,527	26,136
35 years old and over	64,536	54,459	50,057	56,733	58,927

Source: Ministry of Finance and Economy (2022). National Employment Service. Available here.

TABLE 25. USAGE OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN ENTERPRISES BY SIZE OF ENTERPRISE, 2017-2022

Size class of enterprises	Enterprises using computers (10+)		Employees using computers at their work		Enterprises with internet access (10+)		Enterprises that did e-commerce sales (10+)	
	2017	2022	2017	2022	2017	2022	2017	2022
Total	96.0	99.0	28.1	31.3	96.9	98.7	7.7	13.8
10-49 employed	95.6	98.7	31.3	32.6	96.6	98.4	6.4	12.6
50-249 employed	97.6	100.0	21.6	26.4	98.1	100.0	13.3	18.8
250+ employed	100.0	100.0	32.4	36.3	100.0	100.0	12.9	18.2

Source: INSTAT (2022). Usage of Information and Communication Technologies in Enterprises. Available here.

TABLE 26. USAGE OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN ENTERPRISES BY ECONOMIC ACTIVITY OF ENTERPRISE, 2017-2022

NACE Rev.2	Economic Activities	Employees using computers at their work (%)					
		2017	2018	2019	2020	2021	2022
	Total	28.1	26	26.8	27.2	27.8	31.3
I	Accommodation and food service activities	29.9	30.8	26.0	28.6	29.4	29.8
J	Information and communication	73.6	73.9	77.4	75.5	75.2	78.9
S 95.1	Repair of computers and communication equipment	60.8	65.2	65.6	73.7	54.8	56.3
NACE Rev.2	**Economic Activities**	**Enterprises that did e-commerce sales (10+) (%)**					
		2017	**2018**	**2019**	**2020**	**2021**	**2022**
	Total	7.7	5.6	5.8	12.8	13.3	13.8
I	Accommodation and food service activities	12.6	9.0	12.8	38.2	29.0	29.7
J	Information and communication	31.8	23.6	28.5	30.1	32.2	31.6
S 95.1	Repair of computers and communication equipment	0	0	0	0	20	14.3

Source: INSTAT (2022). Usage of Information and Communication Technologies in Enterprises. Available here.

TABLE 27. USAGE OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN ENTERPRISES BY ECONOMIC ACTIVITY OF ENTERPRISE, 2015-2022

NACE Rev.2	Economic Activities	Enterprises using computers (10+)		Employees using computers at their work		Enterprises with internet access (10+)		Enterprises that did e-commerce sales (10+)	
		2017	2022	2017	2022	2017	2022	2017	2022
	Total	96	99	28.1	31.3	96.9	98.7	7.7	13.8
C	Manufacturing activities	95.1	97.5	8.9	10.2	96.1	95.0	3.8	3.8
D-E	Elect., gas, steam &air condit.; Water supply, sewerage, waste manag. &remedi.	90	100	18.4	33.2	100	100	3.3	3.4
F	Construction	96.2	97.1	17.2	21.2	100	100	0.4	1.6

NACE Rev.2	Economic Activities	Enterprises using computers (10+)		Employees using computers at their work		Enterprises with internet access (10+)		Enterprises that did e-commerce sales (10+)	
G	Wholesale&retail trade; repair of motor vehic. & motorcy.	96.2	100	31.8	30.4	97.0	99.5	7.0	13.4
H	Transportation and storage	100	100	27.5	35.4	100	100	25.2	14.8
I	Accommodation and food service activities	91	100	29.9	29.8	90.3	98.7	12.6	29.7
J	Information and communication	100	100	73.6	78.9	100	100	31.8	31.6
L	Real estate activities	100	100	35	50.2	95.7	100	0.0	15.9
M	Professional, scientific and technical activities	100	100	63.3	67.9	100	100	8.5	25.6
N	Administrative and support service activities	100	100	64.7	60.9	94.6	100	14.1	25.5
S 95.1	Repair of computers and communication equipment	100	100	60.8	56.3	80	100	0	14.3

Source: INSTAT (2022). Usage of Information and Communication Technologies in Enterprises. Available here.

TABLE 28. ACTIVE ENTERPRISES BY ECONOMIC ACTIVITY AND SIZE

Economic Activity	Total	Group by the number of employed			
		1-4	5-9	10-49	50+
Total	181,549	164,481	8,247	6,862	1,959
Producers of goods	78,798	74,037	1,972	2,080	709
Farmers	62,922	62,922			
Agriculture, forestry and fishing	1,354	1,187	91	66	10
Industry	8,991	6,162	1,098	1,222	509
Construction	5,531	3,766	783	792	190
Producers of services	102,751	90,444	6,275	4,782	1,250
Trade	42,995	38,810	2,337	1,622	226
Transport and storage	5,689	5,121	289	226	53
Accommodation and food service activities	17,121	14,921	1,464	685	51
Information and communication	4,005	3,401	248	282	74
Other Services	32,941	28,191	1,937	1,967	846

Source: INSTAT (2021). Business Registers. Available here.

TABLE 29. LIST OF MAIN IMPORTERS OF AGRICULTURAL INPUTS

No.	Importers
1	Lico shpk. Bilisht
2	Agrohelp Shpk. Durrës
3	Lila Shpk. Berat
4	Albafert Shpk. Sarandë. Filiali: Lushnje
5	Arli Internacional shpk. Maminas, Durres
6	Agrimatco Albania shpk. Tirane
7	REFERKO Shpk. Fier
8	Planta shpk. *Lushnje*
9	Agrohelp-SA shpk. Durrës
10	Agro Blend shpk. Vorë, Tiranë
11	Shegaj-AGR shpk. Shkoder
12	Meldi Shpk. Tirane
13	Shkelzen Ahmeti Shpk. Shkodër

No.	Importers
14	Agroinput Jazxhi Shpk. Tirane
15	Perla Agro shpk. Elbasan
16	Besniku shpk. Maminas, Durres
17	Agro Zani shpk. Berat

TABLE 30. IMPORT OF PLANT PROTECTION PRODUCTS (PPP) (IN KILOGRAMS)

PPP	2017	2018	2019	2020
Fungicides	404,637	325,914	442,068	511,889
Herbicide	162,484	146,542	359,619	299,407
Insecticides	319,060	219,329	308,848	245,361
Others	154,159	38,007	116,469	76,803
Total	1,040,340	729,792	1,227,004	1,133,460

Source: National Food Authority (NFA) 2021.

TABLE 31. NUMBER OF ORGANIC FARMS, BY AGRICULTURE ACTIVITY, 2019 - 2020 (CERTIFIED FARMS WHICH HARVEST FOREST PRODUCTS, AS WELL AS WHICH CULTIVATE ORGANIC PRODUCTS IN ARABLE LAND AND IN ORCHARDS)

Activities	2019	2020
Arable land	53	59
- Aromatic and medicinal plants)	40	49
- Vegetable	4	4
- Forage	-	3
- Others	9	3
Permanent crops	28	54
- Chestnuts	3	3
- Pome fruit trees	3	19
- Others	2	2
- Olives	12	12
- Vineyards	4	2
- Pergola	4	16
Total	81	113

Source: INSTAT (2021). Statistical yearbook.

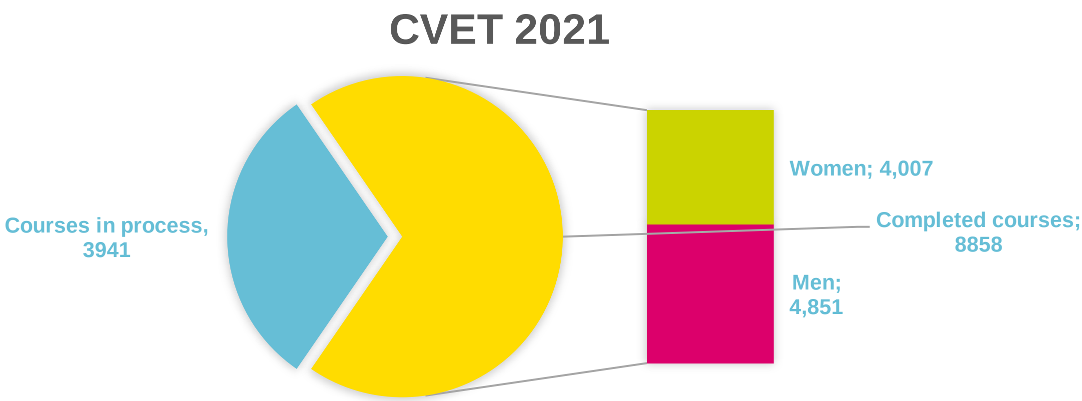
TABLE 32. WILD ORGANIC PRODUCTS, 2019-2021

Description	Area (ha)			Production (ton)		
	2019	2020	2021	2019	2020	2021
Medical and aromatic plants (plants that grow wild in nature are included)	633,465	662,789	537,513	4,615	3,781	7,608
Chestnuts	3,250	2,250	3,520	760	873	1,200
Forest fruits	11,576	12,676	12,676	423	491	420
Total	648,292	677,716	553,709	5,798	5,145	9,228

Source: INSTAT (2021). Regional statistical yearbook.

Educational system in Albania

FIGURE 11. DATA ON ENROLLMENT IN PROFESSIONAL TRAINING COURSES 2021



Source: National Agency of Employment and Skills, 2022. Available here.

TABLE 33. NUMBER OF ENROLLED STUDENTS IN EDUCATION

ISCED-2011	Academic Year	2017-18	2018-19	2019-20	2020-21	2021-22
	Enrolled in education, Total:	652,592	641,161	612,534	589,604	577,869
	In Kinder gardens	81,026	78,942	77,858	71,332	72,384
	In basic education					
1	In Primary education	170,861	167,104	162,170	158,528	154,140
2	In Lower Secondary education	148,810	139,426	132,709	127,958	123,998
	In Upper Secondary education	120,062	116,646	109,533	107,989	103,467
3	Gymnasium & Socio-Cultural	99,457	95,359	89,869	88,965	85,188
4	Vocational	20,605	21,289	19,664	19,024	18,279
5-8	In Tertiary education*	131,833	139,043	130,264	123,797	123,880

Source: Ministry of Education and Sport and the Ministry of Finance and Economy, Administrative data (2022). Available here.

TABLE 34. NUMBER OF PARTNER BUSINESSES AND STUDENTS' INTERNSHIPS BY SCHOOL PROFILE: AGRICULTURE

No.	Profile	Vocational secondary education	Student internships according to partner businesses	
			Students in practice	Partner business
1	Agriculture, forestry, fishing and veterinary	Agricultural Kamez	300	113
2		Hasan D Gina	164	64
3		Kristo Isak	132	85
4		Irakli Terova	130	6
5		Rakip Kryeziu	30	56
6		Charles Tlford Erickson	89	32
7		Kolë Margjini	20	4
8		Ndre Mjeda	18	10
9		Hysen Çela	600	105

Source: National Agency of Employment and Skills, 2022. Available here.

TABLE 35. NUMBER OF PARTNER BUSINESSES AND STUDENTS' INTERNSHIPS BY SCHOOL PROFILE: ICT

No.	Profile	Vocational secondary education	Student internships according to partner businesses	
			Students in practice	Partner business
1	Information and Communication Technology	Agricultural Kamez	300	113
2		Hasan D Gina	164	64
3		Kolin Gjoka	305	110
4		Beqir Çela	600	155
5		Petro Sota	280	80
6		Pavaresia	140	95
7		Nazmi Rushiti	51	7
8		Fan.S.Noli	26	7
9		26 Marsi	112	33
10		Hermann Gmeiner	40	20
11		Thoma Papapano	57	16

Source: National Agency of Employment and Skills, 2022. Available here.

TABLE 36. NUMBER OF PARTNER BUSINESSES AND STUDENTS' INTERNSHIPS BY SCHOOL PROFILE: BIOTECHNOLOGY

No.	Profile	Vocational secondary education	Student internships according to partner businesses	
			Students in practice	Partner business
1	Biotechnology/ Food Technology	Kristo Isak	132	85
2		Rakip Kryeziu	30	56
3		Ndre Mjeda	18	10
4		Isuf Gjata	65	26
5		Hospitality - Tourism	717	258
6		Hamdi Bushati	415	170
7		Hysen Çela	600	105
8		Kolin Gjoka	305	110
9		Kristo Isak	132	85

Source: National Agency of Employment and Skills, 2022. Available here.

TABLE 37. NUMBER OF PARTNER BUSINESSES AND STUDENTS' INTERNSHIPS BY SCHOOL PROFILE: VETERINARY

No.	Profile	Vocational secondary education	Student internships according to partner businesses	
			Students in practice	Partner business
1	Veterinary	Rakip Kryeziu	30	56
2		Ndre Mjeda	18	10

Source: National Agency of Employment and Skills, 2022. Available here.

TABLE 38. NUMBER OF STUDENTS REGISTERED ACCORDING TO VOCATIONAL SCHOOL PROFILES IN ALBANIA 2021/2022

No.	Vocational School Profiles	No. of registered students	%
1	Agriculture	555	3.4%
2	Veterinary	218	1.3%
3	Wood processing	141	0.9%
4	Forest	68	0.4%
5	Information and Communication Technology (ICT)	1,506	9.2%
6	Computer and Software Engineering	313	1.9%
7	Other	9,703	59%
	TOTAL	16,441	

Source: National Agency of Employment and Skills, 2022. Available here.

TABLE 39. STUDENTS ENROLLED IN HIGHER EDUCATION BY FIELDS OF STUDY

No.	Fields of Study School / academic year	2017-18	2018-19	2019-20	2020-21	2021-22
1	Education	10,689	10,062	9,062	8,367	8,085
2	Arts and humanities	15,441	14,348	12,537	10,972	9,536
3	Social sciences, journalism and information	12,259	14,086	11,397	10,277	9,204
4	Business, administration and law	30,233	33,447	32,732	31,173	32,227
5	Natural sciences, mathematics and statistics	6,325	7,060	5,962	4,924	4,553
6	Information and communication technologies	8,228	10,016	8,883	8,341	8,458
7	Engineering, manufacturing and construction	18,730	20,019	20,775	20,537	22,555
8	Agriculture, forestry, fisheries and veterinary	4,564	4,999	4,158	3,458	2,770
9	Health and welfare	19,837	20,727	20,199	21,195	22,130
10	Services	3,088	4,279	4,559	4,553	4,362
	Total	131,833	139,043	130,264	123,797	123,880

Source: Ministry of Education and Sport (2022). Administrative Data. “Fields of Education and Training ISCED-F 2013" Manual. Available here.

TABLE 40. STUDENTS GRADUATED IN HIGHER EDUCATION (AGRICULTURE, FORESTRY, FISHERIES AND VETERINARY) ACCORDING TO EDUCATION LEVEL, SEX, AND YEARS

Field of education	Education level	2017		2018		2019		2020		2021	
		Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
Agriculture, forestry, fisheries and veterinary	Short cycle of higher education (ED5)	0	0	8	14	9	14	20	54	30	101
	Bachelor's or equivalent (ED6)	209	281	246	322	269	296	263	251	321	292
	Master's or equivalent (ED7)	139	188	371	401	215	288	198	274	188	277
	Doctoral or equivalent (ED8)	9	17	7	6	10	19	6	14	4	6
	TOTAL	357	486	632	743	503	617	487	593	543	676
Total number of	Short cycle of higher	0	0	110	275	133	352	404	669	597	725

Field of education	Education level	2017		2018		2019		2020		2021	
		Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
students graduated in higher education	education (ED5)										
	Bachelor's or equivalent (ED6)	13,002	7,421	12,512	7,596	12,280	6,416	11,556	6,029	11,660	5,990
	Master's or equivalent (ED7)	9,014	4,846	8,993	4,641	10,632	4,849	9,329	4,608	9,074	4,251
	Doctoral or equivalent (ED8)	550	340	127	77	132	97	192	102	261	132
	TOTAL	22,566	12,607	21,742	12,589	23,177	11,714	21,481	11,408	21,592	11,098

Source: INSTAT, 2022. Available here.

TABLE 41. STUDENTS GRADUATED IN HIGHER EDUCATION (INFORMATION AND COMMUNICATION TECHNOLOGIES) ACCORDING TO EDUCATION LEVEL, GENDER, AND YEAR

Field	Education level	2017		2018		2019		2020		2021	
		Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
ICT	Short cycle of higher education (ED5)	0	0	12	36	19	49	16	74	11	81
	Bachelor's or equivalent (ED6)	633	767	631	846	614	769	493	698	532	815
	Master's or equivalent (ED7)	345	357	369	423	218	195	222	284	156	231
	Doctoral or equivalent (ED8)	6	1	2	1	1	0	0	0	4	0
	TOTAL	984	1,125	1,014	1,306	852	1,013	731	1,056	703	1,127

Source: INSTAT (2021). Statistical Database. Available here.

TABLE 42. HEI PROGRAMMES ISCED5 AND ISCED6 LEVELS IN ICT, PUBLIC UNIVERSITIES

No.	HEI/Faculty	No.	Study Programme (ED5 and ED6)	Ac. Offer in number of quotas
1	UNIVERSITY OF TIRANA Faculty of Economics Faculty of Natural Science	1	Economic Informatics	240
		2	Informatics	200
		3	Mathematical and Informatics Engineering	100
		4	Information and Communication Technology	100
2	POLYTECHNIC UNIVERSITY OF TIRANA Faculty of Information Technology	5	Computer Engineering	110
		6	Telecommunications Engineering	110
3	ALEXANDER MOISIU DURRES UNIVERSITY Faculty of Information Technology	7	Practical Informatics	34
4	LUIGJ GURAKUQI UNIVERSITY, SHKODER Faculty of Natural Sciences	8	Computing	65
		9	Computer systems and networks technician	30
5	ALEXANDER XHUVANI ELBASAN UNIVERSITY Faculty of Economics	10	Business Informatics	80
		11	Information Technologies	90
6	ISMAIL QEMALI UNIVERSITY, VLORE Faculty of Technical Sciences	12	Informatics	30
		13	Computer science	42
		14	Information technology	40
7	EQEREM CABEJ GJIROKASTR UNIVERSITY Faculty of Natural Sciences	15	Information technology	25
8	UNIVERSITY FAN S. NOLI KORÇE Faculty of Natural Sciences and Humanities	16	Mathematics Informatics	30
		17	Information technology	45
9	AGRICULTURAL UNIVERSITY OF TIRANA Faculty of Natural Sciences and Humanities	18	Information Systems Management	30
		19	Business informatics	90
9	TOTAL	19		1,491