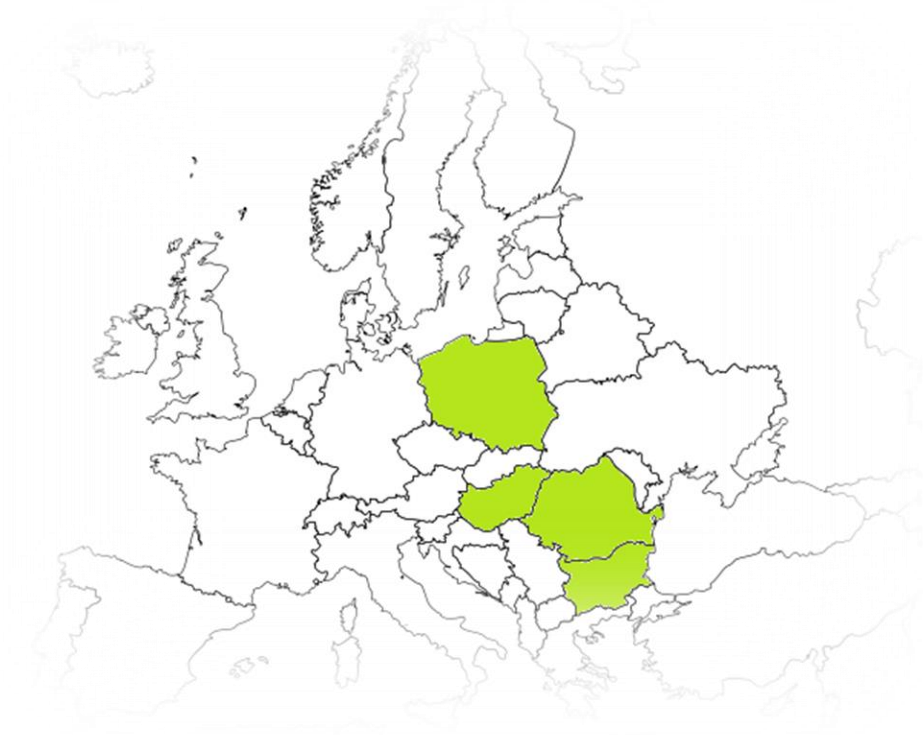




# Agricultural Education in Bulgaria, Hungary, Poland and Romania



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## **Agricultural education in Bulgaria, Hungary, Poland and Romania**

<b>Introduction</b> .....	<b>3</b>
General information .....	3
<b>Bulgaria</b> .....	<b>5</b>
Recommendations for CAP strategic plan, related to education and AKIS.....	5
Overview of agricultural education in Bulgaria .....	5
<b>Hungary</b> .....	<b>8</b>
Recommendations for CAP strategic plan, related to education and AKIS.....	8
Overview of agricultural education in Hungary .....	8
<b>Poland</b> .....	<b>12</b>
Recommendations for CAP strategic plan, related to education and AKIS.....	12
Overview of agricultural education in Poland .....	13
<b>Romania</b> .....	<b>22</b>
Recommendations for CAP strategic plan, related to education and AKIS.....	22
Overview of agricultural education in Romania .....	22
<b>Agricultural internships in the selected countries</b> .....	<b>26</b>
<b>Relationships between institutions in the Netherlands and the countries concerned</b> .....	<b>26</b>
<b>Literature</b> .....	<b>28</b>
<b>Annex</b> .....	<b>29</b>

# Agricultural education in Bulgaria, Hungary and Poland and Romania

## Introduction

This report gives an overview of the agricultural education in Bulgaria, Hungary, Poland and Romania. Aim is to give insight in the structure and the governance of agricultural (or 'green')<sup>1</sup> education. The report is part of an action of Dutch agricultural counselors in these countries, together with GreenPact and the Dutch Ministry of LNV, to pay more attention to cooperation between the Dutch agricultural institutes and the ones in the selected countries.

Part of the European Green Deal is the Biodiversity Strategy and the Farm to Fork Strategy. Circular agriculture, organic farming, less use of pesticides, nutrients and antibiotics are part of these strategies and will play an important role in the agricultural education.

Besides, the European Commission has formulated country specific recommendations for the CAP strategic plans of the countries and related to the European Green Deal. In this report the relevant recommendations are highlighted in case of the importance of it for agricultural education. As education is an important element in the AKIS-system, attention is paid to the specific AKIS situation in the countries.

For each country there is a short description of the agricultural education and the recommendations related to education. The description of the agricultural education in the selected countries contains the following parts:

- (a) In what way is the agricultural education - especially focused on secondary and high school - organized, and is there a cooperation between the several schools. Who (which Ministry) is responsible for this type of education and what is the policy to improve the level of education. Is there special attention to sustainable and circular agriculture?
- (b) Is there an overview of the agricultural schools and universities, are they specialized in certain sectors (numbers and specifications). So is there a list of it?
- (c) Are there links between institutions from this particular country and other European agricultural schools and universities? Which countries are of importance and why? Is there any role for Dutch schools?
- (d) How is the Agricultural Knowledge and Innovation System organized and what is the special role of the schools?
- (e) Are there special relationships between Dutch schools and institutions from this particular country, and if so, how can they be characterized and how are they organized?

At the end a brief summary is given of the number of companies which offer intern ships for Dutch students (info from [stagemarkt.nl](http://stagemarkt.nl), an official Dutch website for internships).

## General information

Table 1 gives an overview of the agriculture in the selected countries. Poland is the largest country of the Central and South-Eastern European countries with the most inhabitants and farmland. It is the country with the lowest share of very small farms and the highest share of young farmers. At the other side Romania has the largest number of farms and the highest share of very small farms. Bulgaria and Hungary are in between.

**Table 1:** Some characteristics of agriculture in the various countries

	<b>Bulgaria</b>	<b>Hungary</b>	<b>Poland</b>	<b>Romania</b>	<b>Netherlands</b>
Population (million)	7.0	9.8	38.0	19.4	17.3
Farmland (1000 km <sup>2</sup> )	45	47	144	125	18
Share of farmland in land area (%)	41	51	47	53	53
Farms (x 1000)	203	430	1411	3422	56
Share of very small farms (%) *)	81	83	65	95	4
Young farmers (%)	14	13	20	7	9

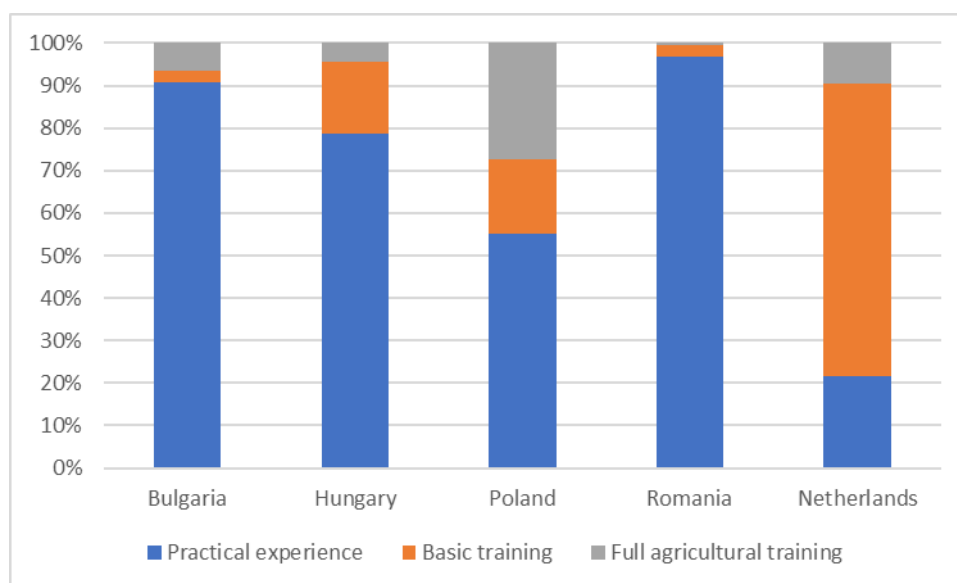
<sup>1</sup> In some cases the schools are describes as 'green' schools, following the Dutch usage of the term 'green' education – meaning all fields related to the agrifood sector (broader than purely agricultural).

Output value (% of total agricultural value)					
cereals	35	26	15	25	2
Industrial crops	20	12	7	8	1
Pigs and poultry	8	20	24	7	13
Milk	7	7	16	5	17
Organic and under conversion (% of total area)	3.5	4.6	4.1	3.6	3.8

\*) Farms < 8,000 Euro standard output

Source: Agriculture, forestry and fishery statistics, Eurostat (2020)

Figure 1 gives an overview of the level of agricultural education of farm managers.



**Figure 1:** Share of farm managers with basic training, practical experience or full agricultural training (at their highest level), 2016 (source: Eurostat)

As shown in figure 1 the highest level of agricultural education of farmers can be found in Poland and Hungary. In Bulgaria 90% and in Romania 97% of the farmers don't have any agricultural education beside practical experience.

# Bulgaria

## Recommendations for CAP strategic plan, related to education and AKIS<sup>2</sup>

### *Labor*

The agricultural sector faces significant human resources challenges. 62% of the work force left the agricultural sector between 2005 and 2017. The vast majority of farm managers have low qualification and lack specialized education. Labor productivity in agriculture is about half of the EU's. Limited employment opportunities and lower quality of life are key factors for the depopulation of rural areas. Young farmers face difficulties in preparing bank loan applications, project proposals and business plans.

### *Agricultural potential*

Bulgaria demonstrates high export potential for rose and lavender oil, honey, pig meat and poultry. Significant potential lies also in organic farming, as a path to generate more value added.

### *Climate*

Bulgaria is one of the EU's most hail prone countries. Like in other countries in the southern regions of the EU, increasing heatwaves and lower precipitation due to climate change make Bulgarian agriculture vulnerable to higher yield variability and heat induced stress for animals, though there are also some opportunities linked to increased productivity or new crops.

### *Weaknesses*

- Land fragmentation
- Lack of irrigation infrastructure
- Insufficient post harvesting infrastructure

### *AKIS*

The capacity of the national agriculture advisory service (NAAS) is not always sufficient. The low level of training and education of farmers and advisors is one of the most acute issues in rural areas. A well-functioning agricultural knowledge and innovation system (AKIS) should deliver a conducive environment to respond to the growing information needs of farmers.

A major coordination role is given to the [National Agricultural Advisory Service \(NAAS\)](#). In the CAP strategic plan they will receive most of the EU funding for vocational training and consultancy. The Bulgarian AKIS is fragmented and there is lack of strategic coordination among its components. The number of institutes and organizations is high, but activities are hard to trace and their quality is unclear. The Bulgarian AKIS's shortcomings may limit the ability to transition towards a greener and more digital agriculture.

It is essential to improve links between public and private advisors and to invest in their training and skills. Advisors should be supported to help capture individual grass roots innovative ideas and to develop them by setting up and implementing EIP operational 6 group projects.

## Overview of agricultural education in Bulgaria

*a) In what way is the agricultural education, especially focused on secondary and high school organized, and is there a cooperation between the several schools. Who (which Ministry) is responsible for this type of education and what is the policy to improve the level of education. Is there a relation with sustainable and circular agriculture?*

Agricultural education in Bulgaria is concentrated in both secondary and higher education. Secondary education is acquired in vocational high schools with a professional orientation in the field of plant growing, livestock breeding, agricultural machinery and veterinary medicine. Cooperation is carried out in the exchange of good practices in the modernization and in the implementation of the educational content both between the institutions in the secondary and the higher education.

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<sup>2</sup> Based on Commission recommendations for Bulgaria's CAP strategic plan. European Commission, Brussels, 18.12.2020 and Todovra (2021)

Joint participation in various projects is provided through national and international programs. The training is aimed at sustainable and market-oriented agriculture. The training guidelines of the Rural Development Program and the CAP are used. An [association of schools of Agriculture, Forestry and Furniture](#) has been established.

Until the entry into force of the new Law on Preschool and School Education, the Vocational High Schools in Agriculture were in force until 01.08.2016 on budget funding through the Ministry of Agriculture and Food. The financing is then carried out through the respective municipality and the Ministry of Education and Science (MES) is responsible for those schools. It pursues a policy aimed at providing quality vocational education. Through joint cooperation with representatives of various producer associations, through local producers and representatives of higher universities, curricula are developed, various Olympiads and competitions are held with their participation to promote the professions in the field of agriculture. In the secondary education, vocational training is carried out by professions from the List of professions for vocational education and training.

#### *Policy to improve the level of education*

The right to choose a profession belongs to the respective school as the main admission to new professions is carried out on the basis of an agreed proposal from the local business and in cooperation with the regional commission with representatives of the local government and the business. The choice of professions is focused on the respective production in the region and most of them are in the farming sector where all sectors are covered - crop production, animal husbandry and mechanization. Another focus is on agro ecology, mechanization, perennials and viticulture. Higher education is carried out mainly in universities with traditions in agriculture such as the Agricultural University - Plovdiv, the University of Ruse - Ruse, the Thracian University - Stara Zagora and the Higher School of Agribusiness and Regional Development - Plovdiv.

#### *Training of teachers*

Teacher training can be aimed at methodological skills or at improving their professional qualifications in the field of innovations in both technology and new production techniques. The National Qualification Program is one of the highlights of the national policy of the Ministry of Education and Science to improve the quality and efficiency of education and training through motivation and continuing qualification of pedagogical specialists. There is no specific program for the teachers in the Professional High Schools on Agriculture. Under the Operational Program Education under the project Support for the Dual System of Education trainings for teachers on topics related to raising their professional qualification are set up and implemented every year. Each school has the right to offer teachers training on various topics related to their career development, for which they have some funding from the budget of each school.

The schools of agriculture have established good partnerships with the Agricultural Universities in Bulgaria and use their centers or departments to improve the qualification of teachers from vocational schools of agriculture - such are the Agricultural University of Plovdiv, Thracian University of Stara Zagora and Ruse University - Ruse.

#### *Focus on sustainable and circular agriculture and need of support*

It would be useful to stimulate further exchange of good practices, the conduct of internships as well as - the training of teachers and students in the latest developments in digitalization in agriculture. The experience of each country is good to share in the field of ecological and organic farming.

*(b) Is there an overview of the agricultural schools and universities, are they specialized in certain sectors (numbers and specifications).*

There are 30 specialized agricultural high schools which are focused on farmers skills (see annex). There are 2 specialized agricultural universities: Agrarian University Plovdiv and the Thracian University Stara Zagora. Another university related to agriculture is the University of Agribusiness and Rural Development in Plovdiv.

*(c) Are there any special links between these educational institutions and other EU educational institutions, which countries play an important role in this and is NL also represented in these?*

The Bulgarian schools participate in various projects. Vocational and higher education institutions can independently participate in Erasmus projects or bilateral relations. The Agrarian University in Plovdiv has several projects with Wageningen University. The University of Agribusiness and Rural Development is partnering with van Hall Larenstein.

*(d) How is the knowledge system organized in the country? Do the schools fit in, and if so, how?*

The major coordination role is given to the [National Agricultural Advisory Service \(NAAS\)](#). In the draft CAP strategic plan they will receive most of the EU funding for vocational training and consultancy.

The higher education schools will be aimed at developing and creating innovations and providing training and consultations for farmers and foresters. The universities are a major incubator of new knowledge through their units and specialists engaged in research and development in the field of agriculture and food. They will perform functions for the implementation of innovations in agricultural holdings and in this regard will be a potential participant in operational groups within the EIP. The vocational high schools are aimed at providing training and consultation for farmers and foresters.

The schools conduct training in professions from the List of Professions for Vocational Education and Training with Acquisition of Secondary Vocational Education. Vocational training centers provide training for adults to acquire a professional qualification in a profession from the same list. Higher schools - by professions in the field of higher education.

Dual education is introduced in Bulgaria within the [Domino](#) project "Swiss support for the introduction of dual track principles in the Bulgarian vocational education system".

The project used mainly the experience of Switzerland, as well as the knowledge of other countries and the good old traditions of Bulgarian vocational education. The project started in 2015. As of the school year 2018/2019, 1,600 students in 32 vocational schools, including 2 specialized agricultural schools in 19 towns were involved.

The [key conclusion](#) was that dual education has appositive impact on vocational education development. But despite positive results dual education in Bulgaria still faces numerous difficulties and obstacles for both, business and schools. These challenges are elements of a larger concern about the development of vocational education in Bulgaria.

Recently a new [Association of Manufacturers and Importers of Agricultural Machinery and Technologies](#) was established. Companies working with Agritech are open to cooperate in training students.

# Hungary

## Recommendations for CAP strategic plan, related to education and AKIS <sup>3</sup>

### *Agricultural Labor*

The overall educational and knowledge level of farmers and others living in rural areas is still below the EU average, hindering their capacity to improve their skills or be more active in the labour market. Rural areas display a high poverty rate, especially as compared with urban areas. Agriculture plays an important role in the rural economy, but faces difficulties in attracting newcomers. Young farmers face additional obstacles in the form of a lack of financing and access to land.

### *Climate*

The sector should prepare for upcoming challenges linked to climate change that will make the management of resources (especially water) very critical to ensuring its production potential. Apart from adaptation, it has great potential to mitigate the adverse impacts of climate events and to contribute to the circular economy. For instance, studies indicate that rewetting agricultural land in Hungary has significant potential to reduce GHG emissions. Agriculture should be prepared for challenges on water management by paying special attention to areas with high soil water retention and organic matter, by promoting practices improving soil organic matter and irrigation systems

### *Other recommendations from the European Commission*

- Efficiency of nutrient management should be improved (e.g. reduction measures ranging from low-emission animal housing to manure storage and fertilisation application techniques)
- Sustainable (re)conversion and maintenance of organic farming should be supported
- Agricultural sector needs to be more attractive by supporting the use of smart, innovative and local solutions
- More attention should be paid to lower the use of antimicrobials and pesticides. Animal welfare, and broadband connectivity need to be improved

### *AKIS*

It is crucial that the results of innovation and technical advance be made more broadly available to farmers and the rural population, so that they can be put to good use. In this context, Hungary should link existing resources and make full use of a well-functioning, widened, agricultural knowledge and information system (AKIS) and the agricultural European innovation partnership (EIP AGRI). Including more downstream food system-related businesses, operational groups, living labs and accelerators, and better integrating information, knowledge, advice, innovation and digital skills (which farmers will need more and more), should also help Hungary's farming sector to become smarter, more sustainable and more productive.

Hungary is among the countries in which the agricultural training of young farm managers is the lowest. Empower farmers, agri-food businesses and people living in rural areas, by fostering knowledge, skills and technological development, exchange, research, advice, digitalization and innovation projects.

## **Overview of Agricultural Education in Hungary**

*(a) In what way is the agricultural education - especially focused on secondary and high school - organized, and is there a cooperation between the several schools. Who (which Ministry) is responsible for this type of education and what is the policy to improve the level of education. Is there special attention to sustainable and circular agriculture?*

The Ministry of Agriculture is responsible for agricultural technical and vocational training, however, programs that fall within the wider umbrella of 'green' education (beyond agricultural training, f.i. in the area of environmental studies) are a part of Hungary's larger education system and under the responsibility of the Ministry of Human Resources.

In Hungary, children go through primary and secondary education between the ages of 6 and 18. Secondary education, (usually starting at the age of 14-15), is possible in various types of schools. Two of these, vocational high schools and trade schools, provide vocational training. Students who attend these will receive a technical education with a high school diploma.

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<sup>3</sup> Commission recommendations for Hungary's CAP strategic plan. European Commission, Brussels, 18.12.2020 and Gáborné et.al., 2020



Normally, vocational high schools (*technikum, szakközépiskola*) and trade schools (*szakközépiskola*) take exactly as long as normal secondary education: Four years, between grades 9 and 12. However, in the field of agriculture, there are other secondary programs. There are vocational high schools that offer five-year programs (with an extra, thirteenth grade), and provide the students with a technical specialist high school diploma. Similarly, there are trade school programs that only reach grade 11 (Making the secondary education program three years) with an extra year of technical training in the field (dual training).

A higher level of technical secondary education is called "OKJ programs" (vocational training). These are short programs available to high school graduates.

The highest level of secondary/vocational education is following up high school with a two-year OKJ training. The next level above this is college/university (Undergraduate BSc/BA training).

In the case of university-level 'green' education, (which in the Hungarian context translates to anything agriculture, environment, nature conservation, etc.) one can go into the 'green' fields at BA level having graduated with:

- School-Leaving Exams in the fields of biology, physics, IT, chemistry, mathematics, nature studies and one language
- Or precursor studies in high school (typically in a relevant trade/vocational school), having finished subjects like commerce and marketing, introduction to engineering, water management, introduction to logistical management, introduction to agriculture, etc. It all depends on the specific program.

There are 60 second-level education institutions under the Ministry of Agriculture and between 2019-2020, these have been re-organized into five regional "agricultural training centers". Also at the university level, there have been efforts to centralize agricultural educational programs under one and the same roof. More information can be found below.

#### *Policy to improve the level of education*

Agricultural secondary and higher level education went through governmental reforms in the recent years. The need to transform agricultural vocational training in Hungary was already identified in the 1990s, following a complete transformation of the agrifood sector with the disappearance of large state farms the reorganization of the socialist agricultural cooperatives and the gradual emergence of family farms and SMEs.

Rapid technological and technical developments further exacerbated the need to transform agricultural education (vocational training and higher education) in Hungary.

The so-called fourth industrial revolution, digitalization, the imminent arrival of robotics and automation, to mention a few factors. Climate change and the associated challenges as well as the need to remain competitive in an EU and international market have further increased the need for reform. Against that background, several shortcomings in the vocational education and training system had been identified:

- The lack of sectoral competences necessary for dual training (formal educational combined with practical traineeship);
- Training is supply-driven and unable to keep pace with rapidly changing market needs;
- Insufficient participation of enterprises (agri-food SMEs) in the dual training already in place;
- The number of students in dual training is below the European average;
- Despite improvements, the infrastructure and equipment of vocational training (especially farms and training facilities) have largely deteriorated and do not offer a real, attractive alternative for students (and their parents) choosing a career;
- High rates of early school leavers without qualifications;
- Few of the teachers of vocational subjects participate in on-site training in enterprises (business), so their knowledge is not able to keep pace with rapid technological developments;
- The adult education and training that has been provided so far has not been sufficiently flexible, has not been specifically focused on the needs of the economy and has not been sufficiently effective;
- The institutional system of agricultural vocational training, the Network of Agricultural Specialized Schools (ASZIH), although covering the whole country, is fragmented, schools are often in competition with each other.

New legislation leading towards both structural and substantive curriculum changes for second-level education, including agricultural vocational education and training, has been adopted in 2020

The aim of the reform is to promote the informed choice of occupation and qualification, to ensure a high quality of vocational education and training adapted to the requirements of the 21st century. It furthermore strives to develop a vocational education and training system based on knowledge-based practical learning, the development of digital knowledge, creative and broad-minded thinking, the ability to adapt flexibly to change, and the strengthening of closer cooperation between vocational education and training and the business sector.

The three main pillars on which the reform is founded are:

1. Providing an attractive study environment: creating quality teaching, well-equipped dormitories and other buildings, teaching cabinets, workshops, sports and leisure spaces;
2. Providing attractive career pathways: creating flexible, predictable career pathways through renewed vocational training, ensuring that students graduate with a competitive qualification, vocational skills and knowledge that is actually required by the economy, thereby securing a steady and competitive income;
3. Ensuring up-to-date trainers: it is essential that theoretical and practical trainers have up-to-date knowledge and are able to keep abreast of technological developments in the sector (digitalization, robotics, precision farming, etc.).

The described measures and changes have been implemented as of 1 July 2020. It will take several academic years to be able to assess the results of the reform.

*(b) Is there an overview of the agricultural schools and universities, are they specialized in certain sectors (numbers and specifications). If so, is there a list of it?*

As mentioned there are 60 second-level education institutions under the Ministry of Agriculture and between 2019-2020, these have been re-organized into five "agricultural training centers" regionally. These are the following:

- Central Hungary Agricultural Training Center: 11 schools
- Great Plains Agricultural Training Center: 13 schools
- Southern Agricultural Training Center: 12 schools
- Northern Agricultural Training Center: 12 schools
- Little Plain Agricultural Training Center: 12 schools

In the case of university-level 'green' education, (which in the Hungarian context translates to anything agriculture, environment, nature conservation, etc.) one can go into the 'green' fields at BA level having graduated with

- School-Leaving Exams in the fields of biology, physics, IT, chemistry, mathematics, nature studies and one language
- Or precursor studies in high school (typically in a relevant trade/vocational school), having finished subjects like commerce and marketing, introduction to engineering, water management, introduction to logistical management, introduction to agriculture, etc. It all depends on the specific program.

In the case of higher education, in 2020, the government has created the Hungarian University of Agriculture and Life Sciences. This was done by the expansion and merging of multiple agricultural universities: Szent István University formed its institutional basis, which was enlarged in August 2020 with the absorption of two faculties from other universities (The Károly Róbert Campus of Gyöngyös of the Eszterházy Károly University, and the Georikon Campus in Keszthely of the Pannon University), and the entire University of Kaposvár.

In order to balance out the new university's education-heavy and research-scarce portfolio, another institution, the National Agricultural Research and Innovation Center, was also incorporated into the university. There are also a number of other universities which have programs and faculties in the fields of agriculture, forestry, nature conservation, etc. [Here is a link](#) with all the universities in Hungary and all their programs.

A considerable loss for Hungarian higher education generally (and for 'green' education too) was the fact that the Central European University (CEU), which has a Department of Environmental Sciences and Policy, moved its educational activities to Vienna following the government's 2017 educational reforms. These reforms were held to be in contradiction with EU law, concluded the European Court of Justice in 2020. Another noteworthy development is that in 2020 the current government privatized multiple public universities, effectively bringing them under the control of private foundations. Critics fear that these foundations will be staffed with people loyal to the current government. These include the University of Theatre and Film, the Corvinus University of Budapest, and the newly created Hungarian University of Agriculture and Life Sciences.

*(c) Are there links between institutions from this particular country and other European agricultural schools and universities? Which countries are of importance and why? Is there any role for Dutch schools?*

Most Hungarian higher level institutions participate in the Erasmus Student Network, and a large number of Hungarian students travel abroad for an exchange semester every year. Scholars also participate in the Erasmus+ program and travel to work abroad for a while.

Erasmus relationships are bilateral, and the specific network differs at each university, based on that institution's foreign relations and the agreement they have signed. HAS Hogeschool and the Szent Istvan University (now the Hungarian University of Agriculture and Life Sciences) are Erasmus+ partners. WUR has an Erasmus+ partnership with the same University, as well as with Corvinus University and the University of Debrecen.

In the case of Horizon Europe, the relevant authority that coordinates international research projects is the National Research, Development and Innovation Office (NKFIH), and agriculture/'green' universities and institutions participate in international projects with the cooperation of this authority as well as the Ministry of Agriculture. In the 2014-2020 period, NKFIH had a consortium-incentivizing subsidy program for innovation projects within the Horizon 2020 framework. This targeted companies but also universities. The program offered grants of up to €223 thousand for consortium building in joint projects to the participants.

As for other foreign partners, there are plans to construct a campus of the Chinese Fudan University in Budapest. No final decisions have been made and the plan is controversial. The Fudan University has departments on life sciences, and environment & engineering.

*(d) How is the Agricultural Knowledge and Innovation System organized and what is the special role of the schools?*

The National Chamber of Agriculture (Nemzeti Agrárgazdasági Kamara, NAK) plays a crucial role in the Hungarian AKIS system. Membership to the chamber is compulsory for the agricultural and food processing sector in Hungary. The Chamber has put in place a two-layered agricultural extension service. The first layer is the village consultants network, which mainly provides farmers administrative assistance and advice, for instance on applications for funding under the EU's common agricultural policy. There are around 610 village consultant employed by NAK.

The second layer is the network of private agricultural extension experts, which focus on substantive knowledge transfer rather than aiding farmers with the necessary administration. The NAK keeps the expert registry and in order for an expert to be included in the registry, it is compulsory for them to take part in annual training sessions. Credit have to be earned to ensure that professional knowledge of the network is kept up to date. According to the register, 1,100 advisors provide advisory services in Hungary.

# Poland

## Recommendations for CAP strategic plan, related to education and AKIS<sup>4</sup>

### *Labour*

Polish agriculture is characterised by diversity in farm structure and potential. However, a significant proportion of farms are managed by farmers aged 55 and older that have no prospects of passing them down to the next generation. Many farmers are also on low income and depend on direct payments.

Address the age unbalance in rural areas and in the agriculture sector through investments targeted to attract young people, to ensure basic services to the population in rural areas, and to foster rural business start-ups and develop the bioeconomy.

### *Digitilization*

To increase farms' profitability, income and productivity it is important that Poland engages in the digital transition of the farming sector by making good use of the EU's technological capacity in satellite observation, precision farming, geolocation services, autonomous farm machinery, drones, etc., to better monitor and optimise agricultural production processes and the CAP implementation.

It is crucial to bridge the urban-rural divide in terms of digital infrastructure coverage and of basic digital skills. Considerable effort is needed to reach the objective of 100% fast broadband coverage by 2025.

### *Environment and climate*

Poland needs to improve its performance on many environmental and climate indices, especially greenhouse gas (GHG) and air pollutant emissions, energy efficiency and water availability and by mitigating the risks stemming from intensifying farming practices.

A related concern is the quality of soils in Poland given their relatively low mean organic carbon content, even though the country has a relatively high coverage of peat and peat-topped soils.

In contrast to the EU average, the total area under organic farming in Poland has been steadily decreasing in recent years. Water availability is a vital problem, caused partially by the weak water retention capacity in the Polish agriculture, exacerbated by the changing climate. Reducing water scarcity by significantly stepping up support for nature-based solutions, appropriate land management practices improving soil water retention such as longer and more diverse crop rotation, and crop adaptation through promoting drought-resilient, less water intensive and improved crops varieties better managing crop-water demand. Support should also focus on irrigation systems best performing in terms of water savings, and on water re-use.

As regards water quality, regional surpluses of nitrogen and phosphorus from the use of animal manure may lead to pollution of ground and surface waters and increasing eutrophication of the Baltic Sea.

Supporting better nutrient management from animal housing to fertilisation techniques, more widespread application of precision farming, improved manure management, setting relevant landscape elements like riparian buffer strips or wetlands, and other technologies, including digital farm nutrient management tools, geared to using inputs more efficiently and decrease nutrient surpluses.

In terms of animal welfare, the persistence of docking of pigs' tails signals the still inadequate conditions on farms that usually motivate this banned practice. Another area of concern is the overreliance on antimicrobials in livestock farming. There are high risks associated with the presence of African swine fever (ASF).

### *AKIS*

The agricultural knowledge and innovation system (AKIS) in Poland is strong and relatively well integrated. Poland has a wide spread body of agricultural educational and research institutions. There are 10 agricultural research institutes supervised by the Ministry of Agriculture and Rural Development, 19 institutes of the Polish Academy of Sciences, which are part of the Faculty of Biological and Agricultural Sciences, 6 agricultural universities supervised by the Ministry of Education and Science and 54 (61 from 1 January 2022) agricultural schools supervised by the Ministry of Agriculture and Rural Development. There is also a growing involvement of researchers and agricultural advisors in implementation of interactive innovation projects.

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<sup>4</sup> Commission recommendations for Poland's CAP strategic plan. European Commission, Brussels, 18.12.2020 and Boczek et.al., 2020.

Advisory services should be prepared to respond to the growing information needs of farms (including small farms) regarding economic, environmental as well as social aspects, and able to provide innovation support.

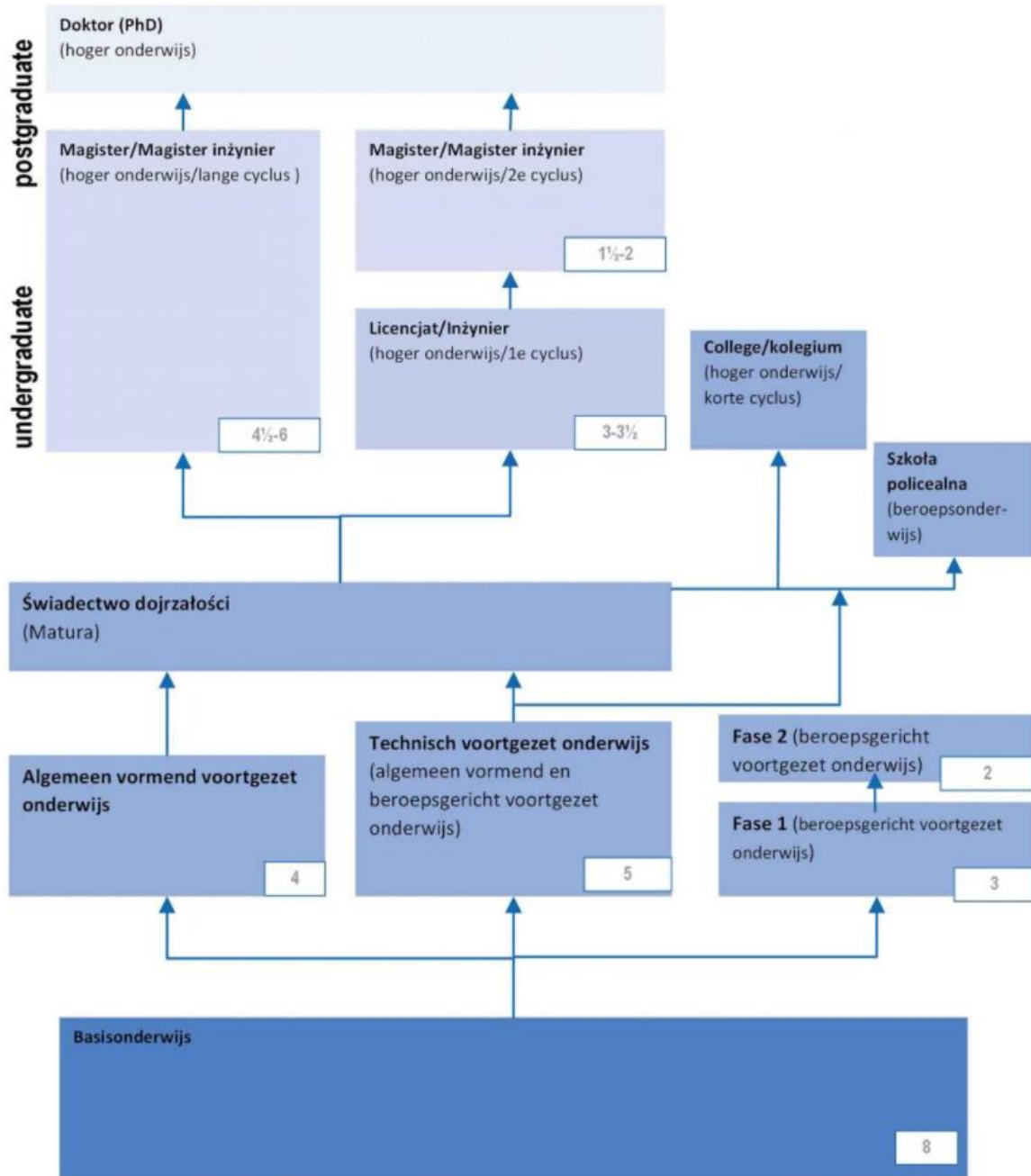
### **Overview of Agricultural Education in Poland**

*(a) How is 'green' education organized, which ministries are responsible, and what are the policies regarding 'green' education?*

The Ministry of Education and Science is responsible for coordinating education policy and therefore has systemic responsibility. However, subject-specific ministries can also establish and manage schools and public educational institutions. A few examples:

- The Minister of Agriculture and Rural Development can establish public agricultural schools and agricultural institutions of regional and supraregional importance and manages public training centers for Vocational Education and Training (VET) teachers of agricultural schools (61 of these schools fall under the Ministry of Agriculture).
- The Minister of Climate and Environment can establish and manage public forestry schools (11 schools at the moment).
- The ministries of, among others, Culture, Infrastructure, Defense, Health and Justice also have their own training centers.

'Green' (vocational) education in Poland falls under the Ministry of Agriculture and Rural Development, more specifically under the Department of Education and Social Policy (Departament Oświaty i Polityki Społecznej). The higher 'green' educational institutions (universities) fall under the jurisdiction of the Ministry of Education and Science. There is no official distinction in Poland between applied sciences and scientific/theoretical sciences, but there are 'general universities' and institutions that are more subject specific, such as Polytechnics and 'akademia'. The level of education per institution is also significant. The Ministry of Agriculture is responsible for 61 of the VET schools in Poland.



Source: Nuffic

**Figure 2:** Nuffic overview of the Polish general educational system, the reformed system is in place since 2016

### Vocational education

The Polish education system for VET (Vocational Education and Training) is divided as follows:

- Phase I sectoral vocational schools ('Fase 1'). For this, students receive a diploma when they pass the professional exam at the end of the training. Students can continue their education in a phase II sectoral vocational school (vocational training school) for a profession in the same line, or students can go to a general secondary school (for adults), starting in the second grade. Students who finish this school can start work, the training lasts 3 years.

- Phase II sectoral vocational training ('Fase 2'), where students obtain a Technician diploma after passing. Students can also choose to take a so-called 'Matura' exam, after which they can continue their studies at the university. This training lasts 2 years.

5-year 'Technikum', comparable to the Dutch MBO ('Technisch voortgezet onderwijs'). This program functions as a secondary school, where students can receive a diploma for their vocational training, but also take a 'Matura' that allows further learning at the university.

- Post-secondary schools ('Szkoła policealna') that provide non-tertiary education to students who have completed their secondary education. This type of education offers 1 to 2.5-year vocational training for students who have already completed their vocational education exams.

On September 1st 2019, a number of additional changes were made to the VET system. Additional regulation has been introduced for classification of VET professions, linked to the core curriculum for this level of education (to ensure that the curriculum per profession remains up-to-date). In addition, closer cooperation is fostered between schools, employers and companies. Schools and employers can enter into agreements to establish a so-called 'patronage' or 'sponsor classes' (klasa patronacka), to train students according to the demand from the labor market. To gain more insight into the labor market, official labor market demand/employment forecasts were introduced, as regular advice from regional 'labor market councils'. Local government is required to weigh the needs of vocational training students as part of a feasibility study for setting up new courses and improving existing ones. Lastly, compulsory exams for vocational training were introduced. Every student or apprentice in a vocational training course must pass an examination to obtain the necessary qualifications for his/her profession.

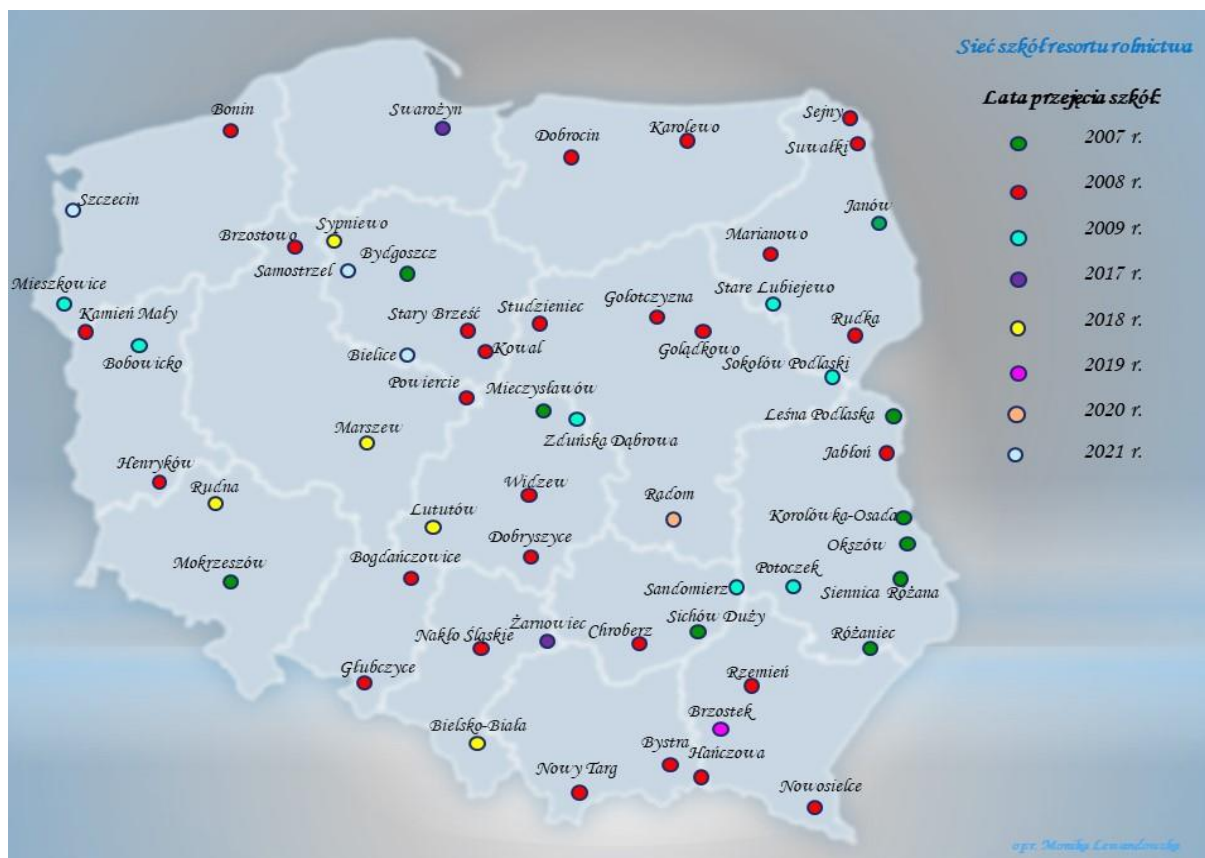
For secondary 'green' vocational education, the Ministry of Agriculture has formulated the following objectives for the coming years:

- forming a network of schools and agricultural institutions throughout the country, in order to develop human capital and the countryside;
- creating conditions in which students have the opportunity to achieve full intellectual, mental and physical development, with respect for dignity and ideological freedom and to prepare them for further education and self-development;
- ensuring a smooth transition from educational structure to professional practice, both in Poland and in other EU labor markets;
- enabling (young) rural residents to close gaps in the education system, with a focus on obtaining appropriate qualifications;
- creating the right material and personnel conditions to promote the professionalism of teachers and subject matter in agricultural schools.

Big challenges for Polish 'green' education are a declining population of the countryside and keeping up with new technology and innovation at educational institutions, to match the technological advances in science and business around the world.

*(b) How many 'green' schools (secondary, high schools, universities) are there? How are these distributed regionally and what is the nature of these schools? Which sectors and is there a specific policy and focus on sustainable and circular agriculture?*

The ministry of Agriculture and Rural Development oversees 61 'green' vocational schools ([see list](#)), which are called Technikums. These courses are followed from approximately 15 – 20 (5 years). Next to these 'government-schools' there are approximately 150 other schools, being funded by either voivodeships (local administrations) or universities. An exhaustive list of these schools is not available. The map below shows the geographical distribution of the governmental agricultural schools (Technikums) over Poland.



Source: Ministry of Agriculture and Rural Development  
**Figure 3:** Geographical spread of 59 Technikums per 1<sup>st</sup> of January 2021 (currently the number has grown to 61 schools).

These 61 agricultural vocational schools (Technikums) under the Ministry of Agriculture in Poland are organized in the Sieć Szkół Rolniczych, an umbrella organization established and funded by the Ministry of Agriculture.



Source: Sieć Szkół Rolniczych  
**Figure 4:** The logo of the governmental organization of agricultural VET schools in Poland.

These schools currently teach:

- Technikums: 13.414 students,
- Vocational primary school: 2,149 pupils,
- Secondary vocational school: 81 pupils.

Working at these schools:

- teachers: 2,644 people,
- administration and service: 1049 persons.

The Minister of Agriculture is responsible for 27 professions in vocational education, which includes both so-called 'first degree' and 'second degree' professions. The difference is in the addition of "technician" behind a profession.

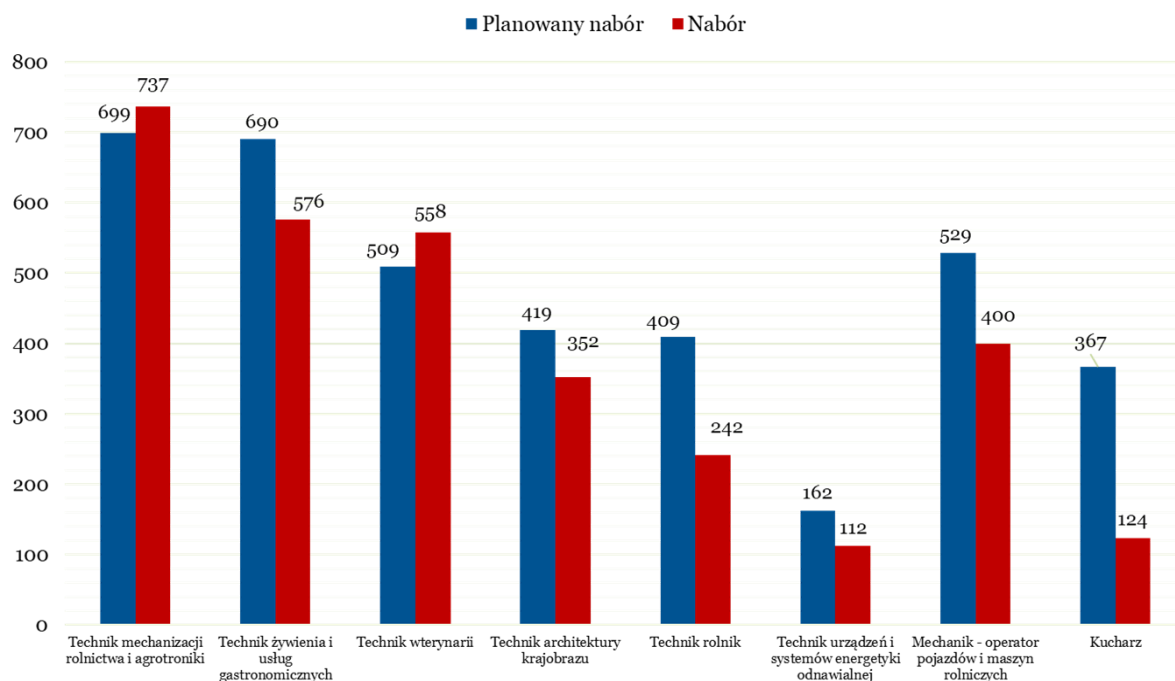
1. pastry chef
2. horse riding (/instructor)



3. cook
4. mechanic of agricultural vehicles and machines
5. gardener
6. operator of machinery and equipment for the food industry
7. baker
8. fish processor
9. beekeeper
10. farmer
11. inland fisherman
12. meat processor
13. agribusiness (technician)
14. Landscaping (technician)
15. horse breeding (technician)
16. environment and drainage (technician)
17. mechanization for agriculture and agro-electronics (technician)
18. gardener (technician)
19. dairy processor (technician)
20. beekeeper (technician)
21. farmer (technician)
22. inland fishing (technician)
23. food technology (technician)
24. rural tourism (technician)
25. renewable energy devices and systems (technician)
26. veterinary (technician)
27. food and catering (technician)

#### Most popular

This graph shows the difference between planned recruitment (blue) and actual enrollment per study program (red) in the year 2020/2021, of the most popular vocational training courses. From left to right: agricultural and agro-electronics mechanization (technician), food and catering (technician), veterinary (technician), landscape architecture (technician), farmer (technician), renewable energy equipment and systems (technician), agricultural vehicle and machinery mechanic , cook.

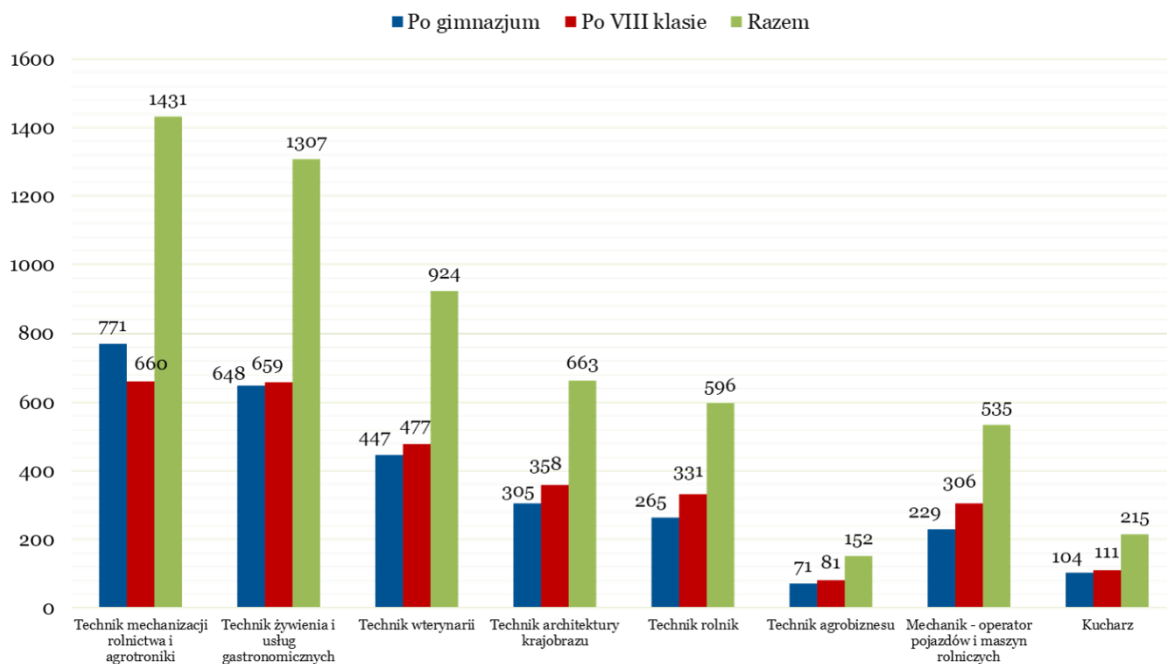


Source: Ministry of Agriculture and Rural Development

**Figure 5:** Planned recruitment (blue) and actual enrollment (red) for most popular studies in 2020/2021

The graph below indicates, instead of planned and actual recruitment, from which educational background the students entered in 2019/2020. The green bar indicates the total number of students registered for the course. For the 2019/2020 school year, the distribution of most popular vocational

courses was as follows (left to right): agricultural and agro-electronics mechanization (technician), food and catering (technician), veterinary (technician), landscape architecture (technician), farmer (technician), agribusiness (technician), mechanic of agricultural vehicles and machines, cook.

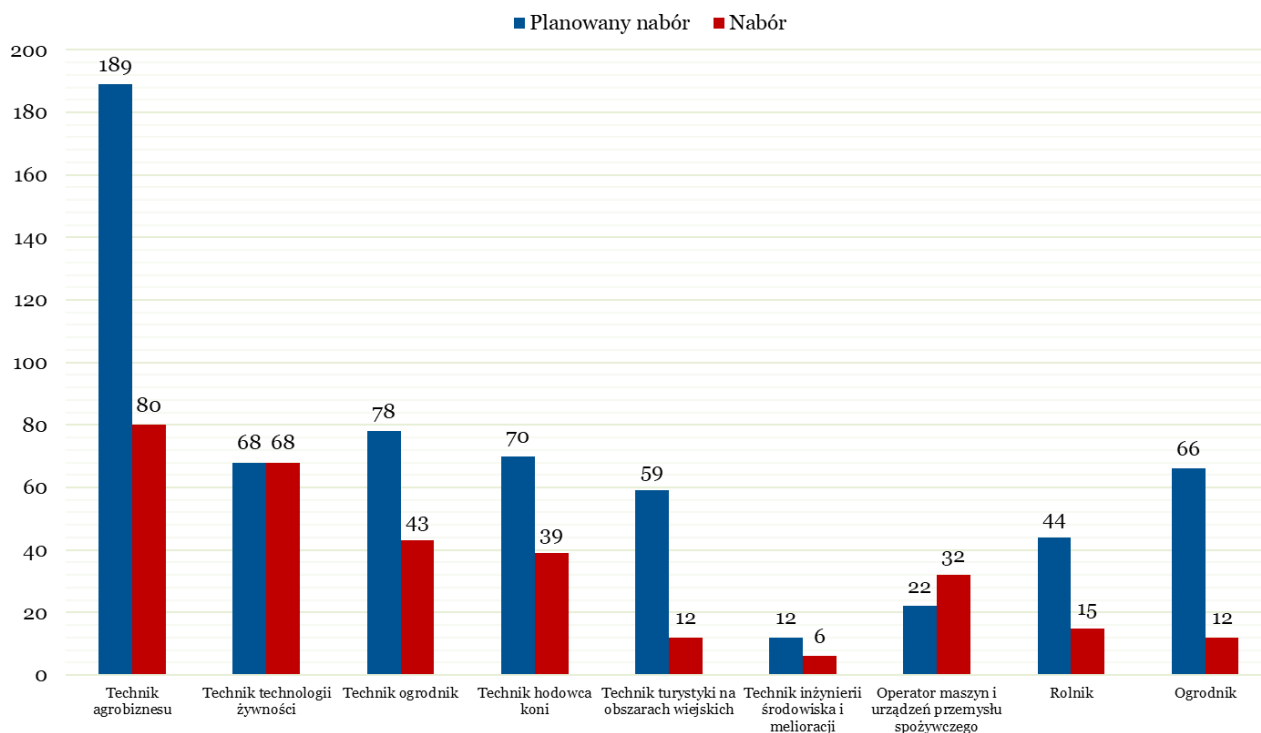


Source: Ministry of Agriculture and Rural Development

**Figure 6:** Actual enrollment on different level and total (green) for most popular studies in 2019/2020

#### Least popular

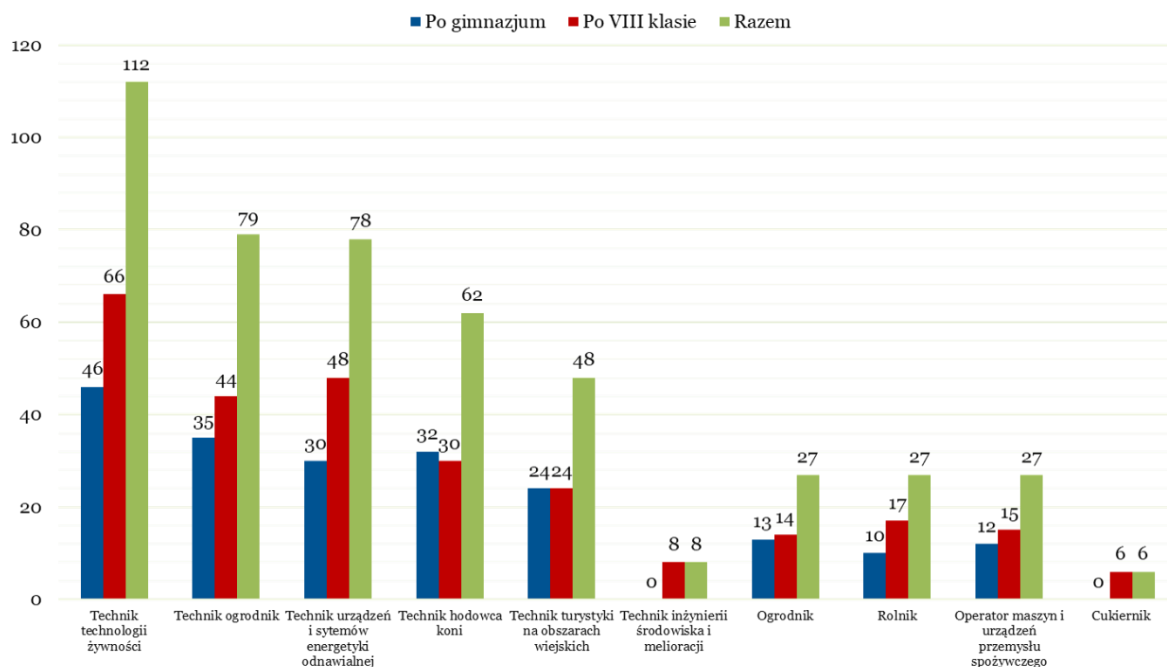
Below is the same overview of the year 2020/2021 of the least popular vocational courses. From left to right: agribusiness (technician), food technology (technician), gardener (technician), horse breeding (technician), rural tourism (technician), environment and drainage (technician), operator of machines and equipment for the food industry, farmer, gardener.



Source: Ministry of Agriculture and Rural Development

**Figure 7:** Planned recruitment (blue) and actual enrollment (red) for least popular studies in 2020/2021

For the 2019/2020 school year, the breakdown of least popular vocational courses was as follows: food technology (technician), gardener (technician), renewable energy devices and systems (technician), horse breeding (technician), rural tourism (technician), environment and drainage (technician), gardener, farmer, operator of machines and equipment for the food industry, confectioner.



Source: Ministry of Agriculture and Rural Development

**Figure 8:** Actual enrollment on different level and total (green) for least popular studies in 2019/2020

### Trends

Comparison of the figures in the red and green bars provides insight into the increase/decrease in popularity of registrations per study program. Agri-business is mentioned as one of the most popular studies - the number of registrations for 2019/2020 totals 152 students, on which the forecast for 2020/2021 (total 189) is based. With 80 registrations in 2020/2021, this is relatively one of the largest declines in popularity. Culinary studies also stands out: in both school years it was one of the most popular vocational courses. Yet it has fallen from 215 students in 2019/2020 to 124 enrollments in 2020/2021. The fastest increase in the number of registrations is for renewable energy studies. This can signify that sustainability and climate are important issues for young Polish people, even though no current government policy is specifically targeted towards marketing these fields. On average, the number of registrations for vocational training in the 'green' sector has fallen in recent years.

### University

There are no specific institutions for the level of 'applied sciences' (HBO in Dutch) in Poland; the formal distinction with a university education is not made, but there are institutes that focus more on practice than on scientific theory. In Poland, there is a division into private and state universities. Only one private university in Poland has the official status of a University (granted by the ministry of Higher Education) - the others are referred to as "Szkoła Wyższa". This term translates in English to Higher School, or to Hochschule in German, but in practice concerns a university with a lower rank, smaller in students and with a smaller number of specializations than 'official' universities.

State universities have in most cases a much higher status and respect than private ones. These state universities are divided into universities specializing in the humanities (languages, law, administration, politics, philosophy, religion, sociology, etc.), in exact sciences (mathematics, physics, chemistry, IT), technical sciences (programming, robotics, mechanization, machines, new technologies and computers) and medical sciences, as well as life sciences (agriculture, veterinary, nature). There are around 15 Life Sciences Universities in Poland, such as the Warsaw University of Life Sciences, Poznan University of Life Sciences and Wrocław University of Life Sciences. These institutes offer higher education in agriculture, agri-tech, agri-food, nature and similar (sometimes interdisciplinary) fields.

A list of the agricultural/'green' higher education institutions in Poland:

- Bydgoszcz: UTP University of Science and Technology in Bydgoszcz (Uniwersytet Technologiczno-Przyrodniczy im. Jana i Jędrzeja Śniadeckich w Bydgoszczy)
- Kraków: University of Agriculture in Krakow (Uniwersytet Rolniczy im. Hugona Kołłątaja w Krakowie)
- Lublin: University of Life Sciences in Lublin (Uniwersytet Przyrodniczy w Lublinie)
- Poznań: Poznan University of Life Sciences (Uniwersytet Przyrodniczy w Poznaniu)
- Warszawa: Warsaw University of Life Sciences/SGGW (Szkoła Główna Gospodarstwa Wiejskiego w Warszawie)
- Wrocław: Wrocław University of Environmental and Life Sciences (Uniwersytet Przyrodniczy we Wrocławiu)

In the veterinary/livestock field, PiWet, the National Veterinary Research Institute, is the most important institute in Poland, offering only PhD studies and practical research work. In addition, the Institute of Genetics and Animal Biotechnology of the Polish Academy of Sciences (PAS) in Jastrzębiec, a research institution for doctoral level, conducts research on animal behavior - not focused on livestock/production animals but mainly on horses and rodents. These type of research institutes are connected through the Polish Academy of Sciences, which is a network with 69 currently operating scientific institutes.

*(c) Are there any special links between these educational institutions and other EU educational institutions, which countries play an important role in this and is NL also represented in these?*

According to the official communication from the Ministry of Agriculture, it is currently possible for Polish Technikum students - through agreements with institutions or countries - to do internships in Germany, France, Spain, Ireland, Greece, Portugal, Italy, Switzerland, Cyprus or Hungary.

France has relations with a number of MBO-level institutions in Poland. The contact with these institutions is managed by the Teachers' Association of Agricultural Education Institutions in France, which organizes exchanges for both teachers and students. The French government has a network all over Europe, with the central points of contact being fulfilled by teachers that are - next to their job teaching at French agricultural VET schools - responsible for creating and maintaining a network of schools and teachers in the country of interest. This network is anchored in the person of this teacher, who provides not only the central point of contact for both sides, but also has a sustainable knowledge base of the agricultural educational system and facilities in the country. The teacher is supported in this network building by the French embassy in Poland and in service of the ministry of Education. This proves to be a very effective method for the French, ensuring sustainable contact and opportunity for cooperation.

Denmark, for example, is also quite active in Poland. Danish presence is stimulated by the half-Polish background of the international coordinator of the agricultural VET school in Arhus. Both French and Danish high level of cooperation with Poland depend on the personal relations both coordinators maintain with Polish schools and government. In the Danish case, this relies solely on the personal cultural background of one coordinator. In the French case, however, the strong ties are institutionalized and cultivated by the French government.

The EUROPEA Network for VET (Vocational Education and Training) schools is a partnership of 25 countries (established in 1992, NL was one of the 7 founding members) that meets twice a year in the country that currently holds the EU presidency. The organization maintains a website and online portal, through which contact can be established in an accessible and direct way. The EUROPEA Network is active in Poland, but the real collaborations are concluded directly at school level and in consultation with the government. When establishing contact, it is important to involve the Education and Social Policy Department of the Ministry of Agriculture in contacting schools and, if necessary, entering into partnerships.

There were a few Dutch VET schools active in Poland in the past - mostly on a one on one based contact without embedding the contact into a deeper (Erasmus) cooperation. Unfortunately most of these schools have lost touch now. On university and applied sciences level, there is more contact - ranging (amongst others) from plans for a dual masters' program, a MoU between Wageningen and SGGW (Warsaw University) to a very popular minor program with HAS, Osnabrück and Poznan.

There is a partnership between the Polish institutions PULS, PiWet and PAS and Wageningen University (WUR). This has been laid down for five years in a Memorandum of Understanding (MoU) since 2015. Currently the focus of this MoU is in joint research in the field of veterinary sciences. It is being discussed to extend this collaboration with more participation of the business community, especially in the field of animal husbandry and animal health.

*(d) How is the knowledge system organized in the country? Do the schools fit in, and if so, how?*

The AKIS in Poland has a two-legged structure, dividing into agriculture- and forest management knowledge systems. The agricultural AKIS is mainly characterized by an advisory councils and advisers. In particular, the Agricultural Advisory Center (Polish abbreviation: CDR) in Brwinów, the associated regional centers (Poznan, Kraków and Radom) and the sixteen Voivodship Advisory Centers are the backbone of the AKIS system. These regional centers provide training to, for example, adults (farmers or other agricultural professionals) who want to update their skillset. They also sometimes organize Train the Trainer courses for Polish vocational teachers.

The CDR is the national institution responsible for the training, certification and registration of agricultural advisers in Poland. The main task of the CDR is to train agricultural advisers. In order to recruit new and sufficiently trained advisers, the center maintains contacts with the network of the 61 agricultural schools that fall under the Ministry of Agriculture.

The various offices of the CDR are spread across the country and focus on different themes. For example, the Radom site focuses on organic production and includes a pilot farm for educational purposes and the Krakow site focuses on rural development, agritourism and farm entrepreneurship. The main areas of focus for the CDR are horticulture/vegetable production, waste water management, chemistry/soil nutrition and market organization. Two international projects they are currently doing are WaterDrive and WaterAgri, with a European collaboration of several countries, including Lithuania and Germany. The location in Radom has a 'test farm' to further develop and pass on knowledge about organic production. The CDR is currently looking for more 'demonstration farms' and has expressed an interest in collaborating on training courses for teachers/advisors in the field of organic/wastewater.

In addition to the CDR, the KCER (Krajowe Centrum Edukacji Rolniczej/Education Center for Agricultural Education) is also located in Brwinów. This center is mainly aimed at contact with schools and monitoring the quality of education at the agricultural schools. It is also responsible for the education of agricultural teachers, in the professions designated by the Polish ministry of Agriculture and Rural Development.

## Romania

### Recommendations for CAP strategic plan, related to education and AKIS<sup>5</sup>

Romania has the highest number of farms in the EU. The vast majority are subsistence and semi-subsistence farms producing mainly for their own consumption. They are poorly equipped and not market oriented. At the other end of the scale, only a small proportion of farms are large, competitive and market oriented. While Romania's geographical position and climate favour diverse agricultural production, it is the country's crop production that it is more competitive, accounting for three quarters of agricultural output. In contrast, animal breeding has been on a downward trend in recent years. Romania has a favourable climate for growing protein crops, e.g. soya, for which it is already the third largest producer in the EU in terms of area. Incorporating further protein crops into the crop rotation will create market opportunities as this will improve soil quality and reduce fertiliser use.

#### *Labour*

Romanian farmers on average earn a relatively low factor income with significant differences between farms of different sizes, sectors, weather conditions, type of areas and between different regions. The employment rate in rural areas is low, especially among women. The rural population is ageing, the poverty rate is among the highest in the EU, the living conditions are poorer than in urban areas. This has led to a massive exodus, especially of the active population. The gender gaps in employment, pay, pensions, care and decision-making need to be closed.

The share of young farmers in the total number of farm managers is low. The lack of access to land finance and education are the main challenges young farmers are faced with. Farms managed by young farmers, who are more open to new and innovative technologies, are more efficient and competitive.

#### *Digitilisation*

Even though Romania has the highest internet connection speed, coverage and connectivity in rural areas are much lower than in urban ones and in other EU countries.

#### *Environment/climate*

The frequency of adverse climatic events (droughts, floods, storms) has increased in recent years. This has affected the agricultural productivity and income of Romanian farmers, and has also affected soil quality, with some areas experiencing increasing soil degradation and aridity.

The quality of soil is below the EU average, mainly due to the intensification of agriculture, reduced crop diversification and low farmers' interest in measures to improve soil. The status of biodiversity in Romania is good.

Special attention should be paid to inappropriate use of antimicrobial agents in animal husbandry and human healthcare. Romania is one of the countries with the highest human mortality rates due to antimicrobial resistance.

#### *AKIS*

The agricultural knowledge and innovation system (AKIS) in Romania is considered weak and fragmented, resulting in insufficient linkages among its various actors.

Links between public and private advisors should be improved, as well as their training and skills. Advisors should be supported to help capture individual grass roots innovative ideas and to develop them by setting up and implementing EIP-AGRI Operational Group projects ('innovation support services'). A well-functioning AKIS would also help to improve the level of education of managers of agricultural holdings as well as basic digital and software skills.

### Overview of Agricultural Education in Romania

*a) In what way is the agricultural education, especially focused on secondary and high school organized, and is there a cooperation between the several schools. Who (which Ministry) is responsible for this type of education and what is the policy to improve the level of education. Is there a relation with sustainable and circular agriculture?*

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<sup>5</sup> Commission recommendations for Romania's CAP strategic plan. European Commission, Brussels, 18.12.2020, Rusu (2014) and Rusu et al., 2018

Before 1990, vocational, professional and technical education in agriculture functioned in close connection with the "economic operators" of the centralized market. After 1990, the structural changes generated by the transition have prompted the decrease in the availability and relevance of vocational education and training, correlated with low business involvement in work-based training and apprenticeships.

The vocational training is organized into vocational schools (these schools are a Romanian subcategory of secondary education, and therefore different compared to the way the Netherlands uses the word "vocational training") that can be independent units or affiliated to state or private technological high schools.

#### *Policy to improve the level of education*

In recent years the pressure of an agricultural business environment requiring skilled labor, the need for economic growth and development has led to a growing acknowledgement at society level of the need to revive T-VET.

From the policy there have been several initiatives which aimed to revive vocational education in general and to better link it to the real needs of the labor market and of various sectors.

The pupils with the lowest scoring obtained on the national evaluation test are often distributed to the technological high schools (agricultural high schools are classified in this category). Most of these are represented by the pupils distributed by the computerized system, and not those who initially opted for this variant. The pupils with high scores opt for and are admitted to the theoretical high schools and vocational high schools. Unfortunately, at present, the agricultural high schools are bypassed by parents and pupils alike, and the training provided by these institutions is not always correlated with the labor market requirements.

Romania set as objective to increase the participation rate of adults (25-64 years) in lifelong learning. There is still a limited participation.

One of the main problems of agricultural high school education is the practical activity of pupils: the lack of high schools that have established partnerships with performant farms/farmer associations, due to the lack of capacity (time, dedicated human resources, and financial) of farms. There is also lack of specialized and entrepreneurial knowledge among teachers. Under these circumstances, students' exposure to any real business experience needs partners: local entrepreneurs – farms and agri-businesses.

Vocational training in Romania is characterized by the poor adequacy of qualifications or curricula to the real labor market needs. There is a lack of a mechanism to ensure the quality of learning within the companies/institutions as well as to develop the pedagogical skills necessary for tutors.

#### *Education of teachers*

Generally all teachers have a University degree (Bachelor/ Master). Some teachers can have a general background (e.g. Mechanics) and some can have specific agri profile. The academic curricula include subjects connected with the science of education so they get pedagogical skills attached to their main profile. Some also take dedicated training for education skills as part of their lifelong learning. Along the teaching career there are different "grades" that one can get to, based on exams organized by the Ministry of Education.

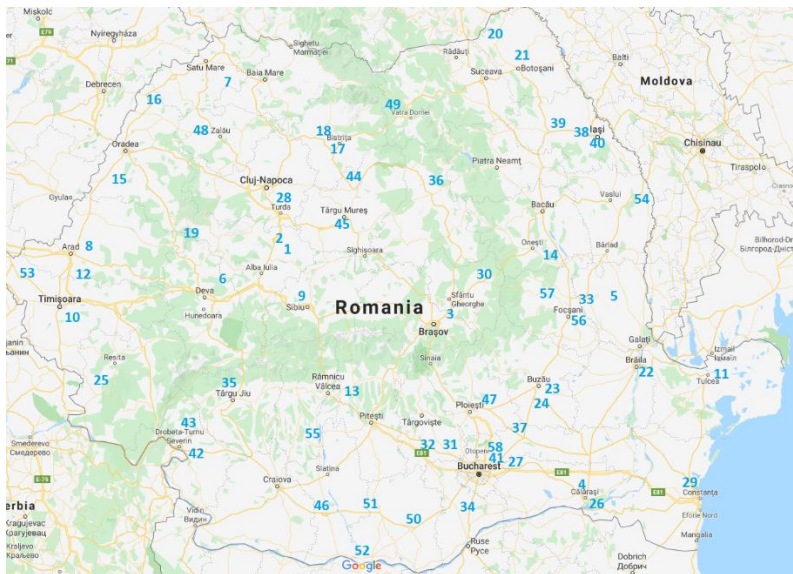
The quality of the teachers is a hot topic for the educational system in Romania in general many strategies and action plans are including it but the reality still struggles to attract top performers into the sector. The up to date knowledge of the teachers depends on the drive and passion of the teacher itself. Some schools are active in bilateral partnerships with the business sector, Erasmus projects or bilateral initiatives that help. Also institutions' connected with the Ministry of Education organize refresher courses (mainly for transversal subjects).

#### *Focus on sustainable and circular agriculture and need of support*

In general the policy of Romanian government has more focus on circular economy, circular agriculture and conservation and improving the bio diversity. The whole AKIS system including the agricultural education need to support these goals.

*(b) Is there an overview of the agricultural schools and universities, are they specialized in certain sectors (numbers and specifications).*

There are 116 high schools in Romania (they are not fully specialized in agriculture but also have professional qualifications in the field), of which 57 are predominantly agricultural high schools and therefore eligible also for support from the Ministry of Agriculture. These schools are included in figure 9. In the school year 2017-2018, 34,497 places were approved for agricultural education in the school plan. 28,734 of these were occupied, representing 75.53% of total.



**Figure 9** Overview of agricultural high schools in Romania

In Romania there are four state tertiary education universities specialized only in agriculture and veterinary medicine (Bucharest, Cluj, Timisoara and Iasi), and 13 tertiary education universities out of which 9 are state units and 4 private units, with different profiles, in which agricultural faculties also exist. Links to the Romanian agricultural high schools and universities can be found on the [Agri Edu Portal](#).

*(c) Are there any special links between these educational institutions and other EU educational institutions. Which countries play an important role in this and is NL also represented in these?*

The Romanian schools participate in various projects. Vocational and higher education institutions can independently participate in Erasmus projects or bilateral relations. The frequency and number of exchanges is unknown. The present use Program Erasmus+ does not work sufficiently to remove the weaknesses.

In 2019, following the signing of a Partnership Agreement between the NL and RO Ministries of Agriculture, a special taskforce Agricultural Education has been established with participants from the Romanian Ministry of Agriculture and Rural Development, Romanian high schools and members of the Dutch Romanian country table. This country table was one of the success factors in the forthcoming collaboration. The original aim of the Dutch country table was to form a network of agricultural schools to cooperate and coordinate their special actions and projects in Romania. The taskforce Agricultural education resulted in a very strong cooperation which provided input for the Romanian strategy for the development of the Romanian agricultural education was developed, and has led to the establishment of the Centre of Excellence for Agri-Food Educational Resources and Sustainable Development. For more information see [Agri Edu Portal](#)

*(d) How is the knowledge system organized in the country? Do the schools fit in, and if so, how?*

In Romania, AKIS bears the imprint of its history. The current system is inefficient in assisting the farmers. There is a limited integration of the consultancy, agricultural research and agricultural education activities.

The public advisory system in Romania is represented by County Agricultural Chambers (CAC) technically coordinated by the Ministry of Agriculture and Rural Development, however subordinated (and financed) by the local authorities. The main objectives targeted by this service are to provide support to the rural population by extension and technical assistance actions, support for accessing the structural funds,



promotion of association forms, managerial consultancy, information, vocational training and refresher courses.

The agricultural education system is also facing difficulties in the process of adaptation to the farm sector requirements. The agricultural education should be restructured in agreement with the structure and needs of the agri-food system (Commission Recommendations, 2020).

## Agricultural internships in the selected countries

Table 2 gives an overview of the registered companies available for internship for Dutch students. In general the share of agricultural internships is high compared with other sectors. But related to mother countries the number of companies is low (eg Canada 204; Australia = 100; Germany 931; UK 617. Total of companies abroad = 7.937).

**Tabel 2** Overview of companies who offer internships for Dutch students

	Bulgaria	Hungary	Poland	Romania
Nr of companies	6	28	30	21
Nr of agricultural related companies	0	9	17	13
Availability of agricultural internships <sup>*)</sup>	0	5	0	14
Sectors	Tourism, administration	IT, dentist, tourism, technics, trade, catering, agriculture	Transport, IT, tourism, agriculture	Health care, ICT, trade, agriculture

<sup>\*)</sup> partly missing information at the website stagemarkt.nl

## Relationships between institutions in the Netherlands and the countries concerned

Most Dutch institutions, both HBO and MBO level have had some contacts with Poland, Hungary, Romania and Bulgaria in the past. Since Wageningen University can find its way abroad relatively easy, because of its excellent reputation – this section is focused mostly on the MBO and HBO levels. To gauge the demand and activities in this region from the Dutch side, several educational institutions<sup>6</sup> in both MBO and HBO levels were interviewed. One main conclusion that can be drawn immediately from these conversations: internationalization is a topic of interest for all these institutions. In this section, we will give a general overview of the demand from the Dutch side and provide examples of successful past cooperation. For the purpose of this short exploration, three different forms of cooperation can be distinguished: 1) student exchanges (both educational and internships), 2) research based or teachers' exchanges, 3) deeper and more sustainable partnerships creating modules, courses or bigger projects.

### Student/teacher mobility

At both Dutch MBO and HBO institutions, international student mobility is seen as a good way for a student to broaden their perspective, gain some experience and develop themselves both personally as well as professionally. Without exception, international student exchange is valued for its formative effect on students. Student mobility takes place in the form of whole semesters abroad (mostly on HBO level) or internships (both MBO and HBO level). This form of exchange is, however, highly dependent on the wishes, motivation and capabilities of a student and the international orientation of their study-area.

Student mobility in the form of internships can also be a viable way to involve companies in the green sector in cooperation. Companies that want to reach young (international) talent might benefit from a more intensive relationship with educational institutions. This could for example be true for Dutch farmers or businesses with a branch in a foreign country, that struggle to reach young talent on the labor market of their country of residence.

Teacher exchanges also take place regularly, but it is highly dependent on the time a teacher can make available. This form of exchange is more promising at HBO than at MBO, because of the research component of education at that level. Schools are looking for comparable institutions and approachable contact with counterparts.

### Sustainable cooperation

Multiple institutions expressed the wish for deeper, more sustainable partnerships. Deeper cooperation takes shape with usually a minimum of three partnering institutions of different countries, and allow for

<sup>6</sup> Interviewed institutions: Van Hall Larenstein, Yuverta, Clusius MBO, Aeres HBO and MBO, Zone College, Terra MBO, HAS Venlo and Aeres Hogeschool Wageningen.

access to more long-term EU funds to set up more ambitious and large-scale projects. These can take the form of shared BA/MA programs, joint minors/modules or even coordinated Centers of Excellence. These kinds of partnerships, however, bring many administrative requirements with them which can be a deterrent for pursuing such projects.

More institutionalized cooperation is also interesting for the educational institutions from an economic point of view. To gain access to other markets and student populations, for instance. One institution specifically mentioned access to students from countries such as Uzbekistan and Kyrgyzstan as a pull factor towards this region. This 'market behind the EU' has a lot of potential, but it is difficult to make contact. There is a movement from those countries towards this region, so contact with universities in for instance Poland can be useful.

#### International networks

The HBO institutions rely mostly on their own networks and EU initiatives. In some cases, the contact with partners has deteriorated over the last years. This has not always been intentional, in some cases it was due to a different political climate either in the country or at the partner institutions – in some cases other priorities were simply more pressing.

To foster cooperation with international (partner) institutions, most HBO institutions rely on either their own networks that coordinators have built from experience over the years or the EUROPEA Network. In addition to this, multiple HBO institutions mentioned the great value of professional competitions. These events are currently organized on an international level by EUROPEA members. In Romania, for example, the World Skills Foundation has created an opening to work together, so that one school now organizes exchanges with a relatively large number of schools from Romania. Poland and Hungary are part of the EUROPEA Network. Many Dutch institutions have collaborated with these countries in the past through this network – some through their own networks (predating EUROPEA). Bulgaria is not yet part of this network. Joining this network might prove to be an opportunity for the country, to expand their international orientation on VET level. 'Green' educational teacher training is organized in the ENTER network, through which contacts in Bulgaria, Poland and Romania exist.

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*Country specific chapters based on the input of Zoltán Szászi (Hungary), Doriana Milenkova (Bulgaria), Anda Popescu (Romania) and Michelle de Groot (Poland).*

## Annex

### Overview of Bulgarian agricultural high schools

Name of the institution	Status of the institution	Type (art. 24-27 / 37-41)	Populated place	Area	Type (art. 35-36)	
						 
Zlatna Niva Vocational School of Agriculture	acting	vocational school	Aytos	Burgas	Municipal	<a href="#">Details</a>
Vocational High School of Agriculture	acting	vocational school	Karnobat	Burgas	Municipal	<a href="#">Details</a>
Borush Vocational School of Agriculture	converted (closed)	vocational school	The pear	Veliko Tarnovo	Municipal	<a href="#">Details</a>
Vocational High School of Agriculture and Tourism	acting	vocational school	White	Varna	Municipal	<a href="#">Details</a>
Zemya Vocational School of Agriculture	acting	vocational school	Provadia	Varna	Municipal	<a href="#">Details</a>
Vocational High School of Agriculture "St. George the Victorious"	acting	vocational school	Strictly	Varna	Municipal	<a href="#">Details</a>
GM Dimitrov Vocational School of Agriculture	acting	vocational school	Danube	Vidin	Municipal	<a href="#">Details</a>
Hristo Botev Vocational High School of Agriculture	acting	vocational school	Bhutan	Vratsa	State	<a href="#">Details</a>
Vocational High School of Agriculture "St. Kliment Ohridski"	acting	vocational school	Kyustendil	Kyustendil	Municipal	<a href="#">Details</a>
Sergey Rumyantsev Vocational School of Agriculture	acting	vocational school	Onion	Lovech	Municipal	<a href="#">Details</a>

Page: 1 2 3 > >> 1 of 3

Name of the institution	Status of the institution	Type (art. 24-27 / 37-41)	Populated place	Area	Type (art. 35-36)	
						 
Marko Markov Vocational School of Agriculture	acting	vocational school	Georgi Damyanovo	Montana	Municipal	<a href="#">Details</a>
Vocational High School of Agriculture "Danube Land"	acting	vocational school	Blacksmith	Montana	Municipal	<a href="#">Details</a>
"QUEEN JOHNNA" VOCATIONAL SCHOOL OF AGRICULTURE	acting	vocational school	Pazardzhik	Pazardzhik	Municipal	<a href="#">Details</a>
Vocational High School of Agriculture "Professor Ivan Ivanov"	acting	vocational school	Dolni Dabnik	Pleven	Municipal	<a href="#">Details</a>
Nikola Yonkov Vaptsarov Vocational High School of Agriculture and Transport	acting	vocational school	Levski	Pleven	Municipal	<a href="#">Details</a>
Vocational High School of Agriculture	acting	vocational school	Puppet	Plovdiv	Municipal	<a href="#">Details</a>
Vasil Levski Vocational High School of Agriculture	acting	vocational school	May Day	Plovdiv	Municipal	<a href="#">Details</a>
Vocational High School of Agriculture	acting	vocational school	Belozem	Plovdiv	Municipal	<a href="#">Details</a>
Khan Asparuh Vocational School of Agriculture	acting	vocational school	I washed it	Razgrad	Municipal	<a href="#">Details</a>
Angel Kanchev Vocational High School of Agriculture and Food Technology	acting	vocational school	Razgrad	Razgrad	Municipal	<a href="#">Details</a>

Page: << < 1 2 3 > >> 2 of 3

## search results

Number of institutions found: 30

Name of the institution	Status of the institution	Type (art. 24-27 / 37-41)	Populated place	Area	Type (art. 35-36)	
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	 
KA Timiryazev Vocational High School of Agriculture	acting	vocational school	Two graves	ruse	Municipal	<a href="#">Details</a>
Angel Kanchev Vocational High School of Agriculture	acting	vocational school	ruse	ruse	Municipal	<a href="#">Details</a>
Vocational High School of Agriculture	acting	vocational school	Sieve	Silistra	Municipal	<a href="#">Details</a>
Vocational High School of Agriculture	acting	vocational school	Nova Zagora	Sliven	Municipal	<a href="#">Details</a>
VOCATIONAL SCHOOL OF AGRICULTURE "BUZEMA"	acting	vocational school	Sofia	Sofia city	Municipal	<a href="#">Details</a>
Geo Milev Vocational School of Agriculture	acting	vocational school	Fog	Stara Zagora	Municipal	<a href="#">Details</a>
Nikola Pushkarov Vocational School of Agriculture	acting	vocational school	Popovo	Targovishte	Municipal	<a href="#">Details</a>
Hristo Botev Vocational High School of Agriculture and Economics	acting	vocational school	Svilengrad	Haskovo	Municipal	<a href="#">Details</a>
VOCATIONAL SCHOOL OF AGRICULTURE AND FOOD TECHNOLOGIES	acting	vocational school	Shumen	Shumen	Municipal	<a href="#">Details</a>
Vocational High School of Agriculture	acting	vocational school	New market	Shumen	Municipal	<a href="#">Details</a>

Page: << < 1 2 3 3 of 3