



**Interreg**



EUROPEAN UNION

**Danube Transnational Programme**  
**DIONYSUS**

**Integrating Danube Region into Smart  
& Sustainable Intermodal Transport Chains**

**Assessment of growth potentials  
for main agricultural products**

**Summary report**

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## Abbreviations

Abbreviation	Explanation
AMA	AgrarMarkt Austria
CAP	Common Agricultural Policy
EU	European Union
GMO	Genetically Modified Organisms
RDP	Rural Development Programme
ÖPUL	Österreichisches Programm zur Förderung einer umweltgerechten, extensiven und den natürlichen Lebensraum schützenden Landwirtschaft
DDGs	Distiller's Dried Grain With Solubles
PASMA	Positive Agricultural Sector Model Austria
NUTS-3	Nomenclature des unités territoriales statistiques-3
EAFRD	European Agricultural Fund for Rural Development
GPS	Global Positioning System
CFP	Common Fisheries Policy
SFA	State Fund Agriculture
TWG	Thematic Working Group
PGA	Port Governance Agency
IWT	Inland Water Transport
SORS	Statistical Office of the Republic of Serbia
IPARD	Instrument for Pre-accession Assistance in Rural Development
CEFTA	Central European Free Trade Agreement
EFTA	European Free Trade Association
US	United States
EAEU	Eurasian Economic Union
SBRA	Serbian Business Registers Agency
DG AGRI	Directorate-General for Agriculture and Rural Development
WTO	World Trade Organization
BiH	Bosnia and Herzegovina
EAFG	European agricultural guarantee fund

NPPC	Národné poľnohospodárske a potravinárske centrum (National Agricultural and Food Center)
IROP	Integrated Regional Operational Program
WB	World Bank
NBS	National Bureau of Statistics
CIS	Commonwealth of Independent States
MARDE	Ministry of Agriculture, Regional Development and Environment
WTO	World Trade Organization
RM	Republic of Moldova
RPIECR	Rural Programme of Inclusive Economic-Climate Resilience
GEF	Global Environment Facility
AIPA	Agriculture Intervention and Payments Agency
NFSA	National Food Safety Agency
AA	Association Agreement
ENP	European Neighbourhood Policy
ATP	Autonomous Trade Preferences
BSECO	Black Sea Economic Cooperation Organization
SECI	Southeast European Cooperation Initiative
DCFTA	Deep and Comprehensive Free Trade Agreement
EEU	Eurasian Economic Union
NBM	National Bank of Moldova
GDP	Gross Domestic Product
OECD	Organisation for Economic Co-operation and Development
FAO	Food and Agriculture Organization
GAO	Gross Agricultural Output



## 1 Focus of the Summary report

The main objective of DIONYSUS is to integrate the Danube Region into smart and sustainable, multi & intermodal transport chains of cargo and passenger flows. An essential element is the development of the Danube Region's river and seaports into smart, sustainable and better connected multi-& intermodal logistics hubs, as well as setting priority locations for industrial investment through EU funding & financing instruments.

The focus of this Summary Report is to provide an assessment of growth potentials for main agricultural products, within the WP T3 – Integrated Port Development work package.

As long as agricultural commodities in general and primary agricultural products in particular have a important share and impact over inland transports, the report is focused on providing an analysis and assessment of growth potentials for main agricultural products as well for certain agricultural inputs (biofuels and fertilizers).

The report also includes:

- *for EU Member States PPs* - an analysis of National Rural Development Programs (RDPs) and other programs or measures with direct impact over the growth of the agricultural production;
- *for PP's in countries in the process of joining the EU* - an analysis on IPARD, part of the instrument for pre-accession assistance (IPA), the instrument for pre-accession assistance for rural development (IPARD) focuses on rural areas and the agri-food sectors of those countries; Measures with direct impact over support reforms in countries and the growth of the agricultural production;
- *for PP's in rest of the countries* - an analysis of national agricultural policy and instruments to support the development and growth of the agricultural production.

The relevant information was collected from existing databases, stakeholder interviews as well as from internal and external experts of the PPs.

### NOTE:

Beside on existing information, stakeholder interviews and on expert expertise especially provided by WConsR supported by internal and external experts of the implementing PPs., the present Summary Report supposed to include as well the findings / conclusions arisen from an regional stakeholder working meeting on ports and agricultural ports traffic, having on the agenda certain discussions about the present situation with regards to the traffic of agricultural products on the Upper Danube Region. - Regional Workshop #1: Ports & Agricultural Products Traffic in the Danube Region Countries [DE/AT/SK].

As long as this workshop **did not take place until the date of completion of this report**, the report **it will need and will be revised**, thus the findings and conclusions of the workshop will be considered and inserted in an Annex, at a later date.



## 2 Executive summary

Agriculture is an important component of the economy in many Danube countries since the geographical and climatic conditions in large parts of the Danube River Basin (DRB) are favourable for agriculture. More than 50% of the basin territory is under agricultural cultivation. Agronomic conditions are especially favourable for maize (corn), soybeans, sunflowers and other thermophilic crops besides the ordinary cereals.

Danube countries agreed to start, in close cooperation with the agricultural sector, a broad discussion process aiming at developing a sound guidance document on sustainable agriculture. The initiative is fully in line with the current political momentum of aligning water and agricultural policies at the EU level and the stronger ambitions of the proposed CAP post 2020 regarding environmental protection and climate change adaptation and the Green Deal with its Zero pollution ambition, Farm to Fork Strategy and Biodiversity Strategy.

The overall economic outlook takes into account changes in macroeconomic conditions, averted this year by the COVID-19 pandemic. COVID-19 will not only shape the world and the EU economies over the next one or maybe two years. It will also likely lead to sluggish growth in the medium-term and bring unusual uncertainty to the recovery shape.

The report includes the main assumptions used for the projections in the medium-term outlook especially for the EU's major agricultural markets. It includes assumptions on the policy and macroeconomic environment, as well as key results of the analysis carried out to assess possible developments caused by uncertain conditions in the PP's countries, which elaborates the Country reports on "Assessment of growth potentials for main agricultural products".

The baseline is based on a set of coherent macroeconomic assumptions. It assumes normal agronomic and climatic conditions, steady demand and yield trends, with no particular market disruption (e.g. from animal disease outbreaks, food safety issues, or a geopolitical event). In addition, the medium-term projections reflect current agricultural and trade policies, including future changes already agreed upon.

There are envisaged the main assumptions used for the projections in the medium-term outlook (by 2030) for EU and country agricultural markets, for main agricultural products. Assumptions on the policy and macroeconomic environment, as well as key results of the analysis carried out to assess possible developments caused by uncertain conditions are also envisaged.

It was made a synthesis, description and analysis of the factors impacting growth of main agricultural products within PP's countries. Content of this addresses to: categories of agricultural land use, main agricultural production areas, surfaces for main crops, developments in land use in correlation with yields, irrigation, mechanization and use of smart farming technology, developments in the use of fertilizers and pesticides, developments in the use of GMO-plants (where appropriate).

The report includes as well an overview of the Rural Development Programs measures aiming increase of agricultural production and efficiency. The analysis is focused on the impact of these measures on primary agricultural production. In particular, the EU measures and financing where analysed, based on which projects in agriculture have been carried out, having as object the endowment of farms with tractors and agricultural machines, storage and conditioning capacities of cereals and other crops (silos), etc., measures taken particularly to improve agricultural production and rise the efficiency level.

## 3 Introduction

### 3.1 Policy and macroeconomic framework

This chapter presents, by countries, the main assumptions used for the projections in the medium-term outlook (by 2030) for country agricultural markets, for main agricultural products (assumptions on the policy and macroeconomic environment, as well as key results of the analysis carried out to assess possible developments caused by uncertain conditions).

Definition of the macroeconomic environment in the PP's country assumes normal agronomic and climatic conditions, steady demand and yield trends, and no particular market disruption (e.g. from animal disease outbreaks, food safety issues, geopolitical event, etc.). In addition, the medium-term projections, the Country reports reflects current agricultural and trade policies based on these macroeconomic assumptions, including future changes already agreed upon.

#### AUSTRIA

In year 2020, Austrian agriculture contributed with 1,3% to the overall GDP, in 2019 with 1.1 %.

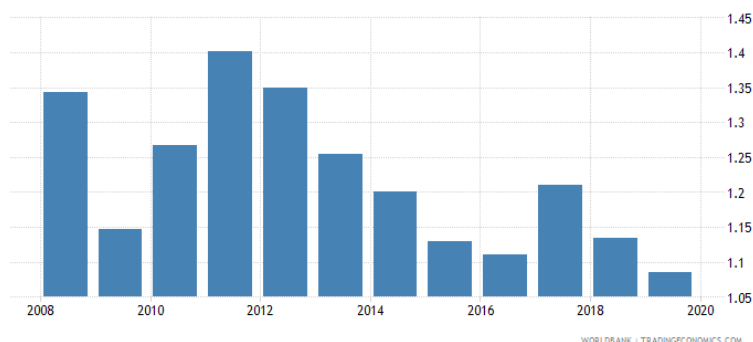


Figure 1: AUSTRIA - Agriculture, forestry, and fishing, value added (% of GDP)<sup>1</sup>

Agricultural income in real terms rose by 5,4% in 2020, after a decline of 5.8% in 2019.<sup>2</sup> The value of the agricultural industry was of 7,7 billion EUR, +3,2% compared to 2019. Crop output accounts currently for 44% of total agricultural output.

#### Farm structure

In 2016, the farm structure survey counted a total of 162.018 agricultural and forestry holdings. In year 1996, there had been as many 239.099 agricultural and forestry holdings counted.<sup>3</sup> Though the

<sup>1</sup> <https://tradingeconomics.com/austria/agriculture-value-added-percent-of-gdp-wb-data.html>

<sup>2</sup> Statistik Austria: [http://www.statistik.gv.at/web\\_en/statistics/Economy/agriculture\\_and\\_forestry/economic\\_accounts/economic\\_accounts\\_for\\_agriculture/index.html](http://www.statistik.gv.at/web_en/statistics/Economy/agriculture_and_forestry/economic_accounts/economic_accounts_for_agriculture/index.html)

structure of Austria’s agriculture remains small-scale, the trend towards larger holdings is still very strong: in 1996, one holding managed a total area of approx. 31,8 ha, in 2016 this average rose to 45,0 ha. A similar development was observed for the utilised agricultural area with an increase from 15,3 hectares to 19,8. Out of the total of 162.018 holdings, 36% were run as main activity farms, whereas 55% were part-time farms (total working time below 50%) - that means around 91% of the agricultural and forestry enterprises in Austria were run as family holdings. The remaining 9% were holdings of joint shareholders or legal persons. The evaluation by types revealed that 20.841 holdings (13%) were cultivating cereals, oil crops, root crops and industrial crops.

### **Subsidies and compensations**

AgrarMarkt Austria (AMA) is the paying agency commissioned by the Austrian government to the European Union to carry out agricultural payments of subsidies and programmes. In year 2020, AMA paid approx. 1,2 billion EUR subsidies to Austrian farmers and agribusinesses, 100% of the yearly direct payments and 75% of the payments through the ÖPUL programme, as well as 75% of the foreseen compensatory allowances.

The **ÖPUL** (Austrian Programme for environmentally compatible Agriculture) was introduced in year 2015 as an important element of the Austrian agricultural policy and regional development. The programme is financed by the EU, federal government and the federal states. The subsidies are paid for voluntary agricultural environmental and climate measures, organic agriculture and animal welfare, above the legal basic requirements. The farmers are bound for at least five years of management according to the funding conditions.<sup>4</sup> The total sum foreseen for ÖPUL in year 2020 was of approx. 448 million EUR.<sup>5</sup>

**“Ausgleichszahlungen AZ”** Compensation allowances for disadvantaged areas: In the course of the AZ, farmers in disadvantaged areas receive a compensation for the increased operation costs of agricultural land with comparatively lower yields. The payments are granted to farmers who cultivate at least 2 hectares of agricultural area in the disadvantaged area. The total sum of AZ in 2020 was of approx. 256 million EUR.

**“Ländlichen Entwicklung – Projektförderung”** is another measure aiming at supporting projects for rural development. A large part of this concerns the measure "Investment in agricultural production". Farmers received for year 2020 approx. 43,4 million EUR<sup>6</sup>.

**„Verarbeitung landwirtschaftlicher Erzeugnisse“** This measure encourages the processing of agricultural produce and paid a total of 8 million EUR for projects developed.

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<sup>3</sup> Statistik Austria:  
[https://www.statistik.at/web\\_en/statistics/Economy/agriculture\\_and\\_forestry/farm\\_structure\\_cultivated\\_area\\_yields/structure\\_of\\_holdings/index.html](https://www.statistik.at/web_en/statistics/Economy/agriculture_and_forestry/farm_structure_cultivated_area_yields/structure_of_holdings/index.html)

<sup>4</sup> <https://www.noel.gv.at/noel/LaendlicheEntwicklung/OEPULAgrarumweltprogramm.html>

<sup>5</sup> <https://www.lko.at/ama-%C3%BCberweist-restzahlungen-f%C3%BCr-l%C3%A4ndliche-entwicklung-und-direktzahlungen+2500+3391401>

<sup>6</sup> <https://www.topagrar.at/management-und-politik/news/1-2-milliarden-euro-ausbezahlt-12433401.html>

## **COVID-19 Support**

For the compensation loss due to COVID 19, the Federal Government provides up to 60 million EUR of non-refundable subsidies.

## **BULGARIA**

Following accession to the EU in 2007, the Bulgarian agriculture sector underwent a structural transformation, characterised by steady growth in gross value added (GVA) and a polarisation of farm structures. Despite more than 80% of the farms in Bulgaria being categorised as smallholders (below 2 ha), most of the output and exports of the sector are produced by a small number of large-sized farms (2% manage more than 100 ha). These farms are particularly prevalent in the less-labour intensive sub-sectors such as cereals and oilseeds.

### **Gross Domestic Product**

In 2019, GDP grew by 3.7% in real terms compared to the previous year. In nominal terms it amounted to BGN 119,772 million (EUR 61,239 million), with a per capita amount of BGN 17,170 (EUR 8,779).

### **Gross Value Added**

The gross value added created by the sectors of the national economy in 2019 amounted to BGN 103,383 million (EUR 52,859 million) at current prices, showing real growth of 3.3% compared to the previous year. The value added of the subjects of the agricultural sector in 2019 amounted to BGN 3,876 million (EUR 1,981,77 million) at current prices. In real terms, it shrank by 4.1% on annual basis.

By economic sectors, the GVA for 2019 was distributed as follows:

- Industry (including construction) - 25.0%;
- Services - 71.2%;
- Agrarian (agriculture, forestry and fisheries) - 3.8%.

### **Employment and unemployment**

According to NSI data, the average annual number of employees aged 15 and over in 2019 was 3 233,1 thousand - representing an increase by 80,4 thousand compared to the previous year. The number of persons employed in the agriculture, forestry and fisheries sectors increased by 3.2% up to 214,1 thousand, observing the preservation of the relative share of the sector in the structure of employment by economic activities (approx.. 6.6%).

### **Export and import**

According to BNB preliminary data on the balance of payments, in 2019 Bulgaria's exports amounted to BGN 56,953 million (EUR 29 119 million) - by 5% above the level of the previous year, representing 47.6% of the country's GDP. Imports registered similar increase - by 5.1% to BGN 62,607 million (EUR 32,011 million) or 52.3% of GDP. Thus, in 2019, the negative trade balance

extends to BGN -5,655 million (EUR 2.891 million), compared to BGN -5,278 million (-2,699 million) for 2018.

### **Foreign Direct Investment**

According to BNB preliminary data, FDI in the country for 2019 amounted to BGN 2,227 million (EUR 1,139 million), 15.8% below the level of the previous year. Direct investment during the year represented 1.9% of GDP, compared to 1.8% in the previous 2018.

Within 2019, net foreign investments in agriculture, forestry and fisheries during the year amounted to EUR 63,6 million.

### **Trade**

The main partners of Bulgaria in the trade in agricultural commodities are the countries of the European Union. In 2019, agricultural trade with the EU increased by 4.9% on an annual basis, with the Union's share of the country's total agricultural exports being 67.7% and that of agricultural imports – 77.1%.

## **CROATIA**

Agriculture and food production are of exceptional importance for Croatia and constant work on production competitiveness are necessary for successful integration of Croatian agricultural sector in EU market. Since Croatian self-sufficiency in food products is still very low, the first policy objective is to increase domestic supply with high quality products at reasonable prices. However, some research from the past show that less than 30% of domestic consumers think that origin of the purchased product is important.

In achieving better production results, a little disturbing may be results of some studies showing the consequences of the recent CAP (Common Agricultural Policy) reform through introduction of the Single Farm Payments and decoupling support for farmers with cross compliance obligations.

If agriculture and food-processing industry are observed as a complex in which agricultural outputs serve as inputs in food-processing industry, or as a complex whose outputs from both sectors are mostly used as food and feed, we conclude about its great importance, as from the aspect of the number of employed persons, generating value added, contributing to the foreign trade balance, so from the aspect of ensuring food security for Croatian people. The complex contributes to the total GDP with 9.1% (Ø 2004 – 2007), with about 11% and 10% in total export and import respectively (Ø2008 – 2011), and in total employment with more than 20%.

Compared to the European average, yields in agriculture are low and uncertain, reflecting on unbalanced market situation and foreign trade balance which is in long-term deficit. Official data for the last two decades show that Croatia was a net-importer of agricultural goods and food products and the greater share of imports comes from the EU markets.

Value of agricultural production shows slight, but unsteady rise in the past decade, and the sector itself contributes to the total GDP for about 4% in 2018. The greatest part in total agricultural value has crop production, mostly cereals, while livestock products contribute with about 40% in total



value of agricultural production. As a positive consequence of agricultural policy measures carried out through several action plans (setting up of permanent crops plantations, vegetable growing, cattle production, pig production), areas under vineyards and olive plantations were increased in the Mediterranean region.

**The agri-food sector stakeholders in Croatia have defined a shared vision** that will “produce more and high quality and nutritious food at competitive prices, sustainably manage natural resources in a changing climate, and contribute to improved quality of life in rural areas and increased rural employment.” This statement recognizes the importance of addressing sustainable natural resource management in a context of accelerating climate change and consumer demand shifts.

**To realize this shared vision of success, future policies and programs can enable the re-positioning of Croatia’s agri-food sector in domestic, regional and international markets.** Considering Croatia’s factor endowments, the comparative advantages linked to its geography and proximity to large and diverse EU markets, changing consumer preferences and growing domestic tourism demand, and fast-paced technological developments, future agriculture and rural development policies and programs can enable a more market-driven development of agriculture in Croatia, where improved productivity on-farm, efficiency gains along the value chain and competitiveness of Croatian products drive the agri-food system. Public support can enable large producers to materialize on economies of scale, while modernizing their production base and improving their efficiency, while small and medium-scale producers can optimize their production through diversification strategies and innovation. Improving the overall value added of the sector can generate more jobs in rural areas, strengthen rural livelihoods and promote the differentiation of Croatian products in the country and abroad.

**Accelerating the structural transformation of Croatia’s agri-food sector in a climate-smart manner will be fundamental to strengthening its competitive position.** The high shares of GDP and employment that still depend on the primary sector, the low levels of productivity, the existing rural/coastal-urban income divide, and the persistent link between poverty, vulnerability, and agriculture, signal that the process of structural transformation of Croatia’s agri-food sector is not yet complete. Added to this are the more frequent extreme climatic events that constrain sector performance and significantly increase the risk to producers. This incomplete structural transformation constrains the competitive position of Croatia’s agri-food sector and limits its potential contribution to economic growth, employment and income levels in rural areas. Accordingly, future agriculture and rural development policy and program priorities should be geared toward breaking down the existing link between poverty, vulnerability, and agriculture in Croatia by addressing structural constraints to transforming Croatia’s agri-food sector and achieving higher growth, employment and incomes in an inclusive manner. Considering the threats – and some opportunities – of climate change impacts and risks, climate mitigation and adaptation co-benefits ought to be fully integrated in these efforts.

## **REPUBLIC OF MOLDOVA**

In 2020, MARDE initiated the process of elaboration of the National Strategy for the Development of Agriculture and Rural Environment 2021-2030, which will contribute to the implementation of Pillar 1 and 4 of the National Development Strategy "Moldova 2030", respecting the commitments on the implementation of the 2030 Sustainable Development Agenda, and its adaptation to the development needs of the sector, the Moldova-European Union Association Agreement, while ensuring , the continuity of the activities planned for the National Agricultural and Rural Development Strategy for the years 2014-2020, approved by Government Decision No. 409 of 04.06.2014, such as:

- reducing the level of poverty in rural areas;
- increasing the competitiveness of the agricultural food sector;
- adaptation of agricultural producers to climate change;
- stimulating the growth of strategic agricultural and business activities in rural areas.

Agriculture continues to be an important sector in the economy of the Republic of Moldova, but is currently in decline. According to NBS data, in 2020, the contribution of agriculture, forestry and fisheries to gross domestic product (GDP) amounted to 9,5.

The macroeconomic environment of the Republic of Moldova is similar to that of the countries, covered by the European Neighbourhood Policy (ENP) and other countries in the region, but differs from that of the EU Member States. If we represent the share of the gross value added of agriculture in the region's GDP, we can see that agriculture plays a vital role in Eastern European economies, with its contribution accounting for around 10% of GDP over the past decade.

The employment rate in agriculture of the Republic of Moldova remains important, but is also in decline, both in absolute and relative terms. The analysis of the results of the Labour Force Survey (hereinafter - AFM) shows that in 2020 the workforce (active population) of the Republic of Moldova, which includes the employed population plus the unemployed, constituted 867.3 thousand people, decreasing by 5.7% compared to 2019 (919.3 thousand). In the labour force, the share of men (52.4%) was higher than that of women (47.6%), and the share of economically active people in rural areas was higher than the share in urban areas (54.4% and 45.6% respectively).

Although the agricultural sector continued to play an important role as an occupational opportunity, representative rates and the number of employees in the sector have decreased. Agricultural workers have either found employment opportunities in the developing services sector or have been forced by the structural process to migrate. Rapid structural changes in the country's economy have led to new employment opportunities in non-agricultural sectors, thus making the migration of the population from rural areas conditional. Due to the increasing employment opportunities outside the agricultural sector, the migration process has evolved in two directions: internal migration, from rural to urban areas and external migration to foreign markets, in search of higher incomes.

The main partners of the Republic of Moldova in agri-food trade are the EU and CIS countries, where 90% of agri-food products were exported. According to the products exported in the period 2006-2019, the main export destinations for agri-food products from the Republic of Moldova were Romania, Germany, Belarus and Ukraine, accounting for 60% of total agri-food exports for 2019. It is important to note that the share of agri-food exports from the Republic of Moldova to CIS countries



decreased by 30% in the years 2000-2015, and in the last three years it has decreased to a quarter compared to the volume of exports to EU countries.

The Republic of Moldova is a net exporting country of agri-food products, whose agriculture generates almost half of the country's export revenues, whereas its agri-food trade balance is declining. Thus, the export of agri-food products consists mainly of low-value products and unprocessed raw materials and the import of agri-food products consists mainly of processed products.

The agri-food sector in the Republic of Moldova still remains poorly financed, about one third of the demand for external financing for the agri-food sector is covered by bank loans, one-fourth - loans from suppliers and only 3% - of state subsidies. In the last three years the volume of loans granted to the agri-food sector has increased. The agri-food lending process revealed a number of systemic disadvantages, including insufficient provision of long-term loans (usually 3-year investment loans), high interest rates, poor collateral policies (excessive collateral requirements, undervaluation of collaterals/mortgaging by banks), combined with poorly developed market instruments to facilitate access to loans (loan guarantee funds , interest subsidies).

## **REPUBLIC OF SERBIA**

The process of the Republic of Serbia's accession to the European Union requires the harmonization of regulations and standards in agriculture with regulations and standards in the European Union. The harmonization of the regulations in the field of agriculture is in process, while this is one of the most comprehensive processes of the harmonization of regulations. The Strategy for Agriculture and Rural Development should contribute to better use of resources in agriculture simultaneously achieving a higher level of competitiveness of agriculture. The Strategy for Agriculture and Rural Development would also have to provide a way to adjust the regulations of the European Union and harmonization with the Common Agricultural Policy (CAP) of the European Union.

In the Republic of Serbia, the Strategy for Agriculture and Rural Development for the period from 2014 to 2024 has been adopted. The strategy has well-defined objectives; however, the description of the current situation in agriculture, the ways to achieve the defined objectives, the sources of funding for the purpose of achieving them as well as other parts of the Strategy have certain shortcomings, which lead to the attainment of the goals of the Strategy.

Rural development is supported via a 7-year rural development programme (IPARD). IPA II provides primarily investment support to boost the competitiveness of the agri-food sector and it assists with its gradual adjustment to EU hygiene, food safety, veterinary and environmental standards, and to develop climate resilience and diversify rural economy. Moreover, establishment of producer groups, rural infrastructure, training actions, including advisory services, agri-environmental measures, forestry, and Leader local initiatives may be supported through the IPARD programme. The IPARD programme also reinforces capacities of relevant EU funds management structures for them to be able to efficiently manage and implement the programme in line with the EU requirements; the establishment of the IPARD implementation system should therefore be one of the main priorities. Institutional capacities of the agrarian agency and supporting organisations such as extension and

advisory services should be strengthened in order to prepare for access to EU support through direct implementation of projects.

The following indicators will be used to measure progress:

- Doing Business – Distance to frontier, score (WB).
- Total investment generated via IPA in agri-food sector and rural development (DG AGRI).<sup>7</sup>

Types of financing

In the area of agriculture, the reform and administrative capacity building process will be supported through services, works, supplies, and twinning. Grant contracts can be used to support other services. IPA II multi-annual support in the area of rural development shall be provided through measures financed under the Rural Development Programme (IPARD).

## **SLOVAKIA**

The territory of Slovakia is considered to be very diverse in terms of soil types and natural conditions themselves. In general, the best growing conditions are characteristic of the fertile Danubian Lowland, the Yugoslav Basin and the East Slovakian Lowland. In these areas, peas are predominant, ie areas where cereals, maize or rapeseed are grown. In other areas, grasslands predominate. The comparison of agricultural maps for the years, ie 2016, 2017 and 2018, shows a relatively stable distribution of the cultivation rate of individual crops. In the last two years, however, there has been an expansion of corn fields, which also currently rank second overall. But let's get on with it.

The total agricultural area is approximately 2 million ha, which is divided into approximately 168,000 fields, with an average field area of 12 ha. The largest area consists of permanently grassed fields located mainly in the central and eastern part of Slovakia, in this case we are talking about an area of almost 680,000 ha, where the focus is more on animal production.

As for arable land, they are concentrated in the above-mentioned fertile areas, especially in the southern part of Slovakia. The first place in this respect is maize, which is grown on up to 574,000 ha, followed by wheat and related crops grown on a total area of 326,000 ha. The imaginary third place belongs to rapeseed as a technical crop, which is grown on approximately 151,300 ha. In the overall table, it is followed by soybeans, barley and sunflower. Finally, for the sake of interest, let us mention the last two places of recorded crops, on an area of 69.3 ha, spices are grown in our territory and 53.8 ha belong to rice cultivation.

In terms of enterprises in the agriculture sector there is dual field structure in the Slovak Republic.

- higher number of natural persons with a very small area of land, however, which are not significant for the whole of society as a whole, and

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<sup>7</sup><https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/20180817-revised-indicative-strategy-paper-2014-2020-for-serbia.pdf>

- lower number legal entities, which represent an economically and productively decisive part of enterprises. This part enterprises have a predominantly large-scale production character with a predominance of leased land, with a relatively low rate of diversification of non-agricultural activities, bio cultivation of crops, low level finalization of production.

According to the farm census, in 2010 there were 24,463 farms in the Slovak Republic focused on agriculture activity. Numerically (9,460) most farms (38.7%) managed on an area of less than 2 ha p. p. Next numerically decisive group of farms (6290), with a share of 25.7% of the total number of farms, farms from 2 to 4.9 ha p.p. with minimal market participation. On an area of more than 100 ha, 9% of farms farmed, which were crucial for the production and maintenance of the agricultural land in good condition.

In terms of age structure, most employees in 2010 were over the age of 50, and that is the case for legal and natural persons (tab.13, appendix 1). Young farmers under the age of 40 worked for legal entities 18.8% and for natural persons 13.3%.

## **HUNGARY**

The share of domestic agriculture in 2019 was slightly lower than in previous years in terms of gross value added (4.1%), employment (4.7%) and investment (4.0%). This was due to the fact that the performance of agriculture decreased and the volume of investment increased to a lesser extent than the national average.

The combined foreign trade turnover of agriculture and the food industry in exports and imports in 2019 expanded at a similar rate compared to a year earlier. In parallel with the growing turnover, the balance improved, the surplus amounted to HUF 894 billion.

The output volume of EU agriculture in 2019 has only slightly increased (0.5%) compared to the previous year. Hungary accounted for 1.9% of EU agricultural output. We accounted for 2.1% of crop products and 1.8% of animals and animal products. 4.4% of the EU's output from cereals, including 11% from maize, came from Hungary. Our industrial crop output contributed 5.4% to the performance of the EU, mainly related to the production of oilseeds. Our poultry production accounted for 4.2% of the EU's total output.

The production of certain product groups in the crop production sector varied: the yield of the main cereals increased, the cultivation of industrial crops decreased, and there was a decrease in the growth of vegetables and fruits.

In 2019, the output value of the agricultural sector (including services and secondary activities) at current prices was HUF 2,789 billion, of which crop production accounted for 57% and animal husbandry for 36%. The ratio of primary activities has remained relatively the same over the past ten years, apart from a few percentage points.

## 3.2 Production-related impact factors

This chapter presents, country by country, an analysis and description of the factors impacting growth of main agricultural products within PP's countries. Has been considered the following aspects: categories of agricultural land use, main agricultural production areas, surfaces for main crops, developments in land use in correlation with yields, irrigation, mechanization and use of smart farming technology, developments in the use of fertilizers and pesticides, developments in the use of GMO-plants (if applied).

### AUSTRIA

#### Categories of agricultural land use

The structure of Austria's agriculture is still mainly small-scale, despite the trend towards concentration into holdings. In year 2000, one agricultural holding managed on average a total area of 31.8 ha, in 2016 this average had grown to 45.0 ha. The utilised agricultural area also increased from 15.3 hectares in 2000 to 19.8 hectares in 2016.<sup>8</sup>

In 2016, 91% of the agricultural and forestry enterprises in Austria were run as family holdings.

The trend towards organic farming continued: According to the results of the farm structure survey 2016, 22 508 farms (17%) were managed as organic farms. The organically cultivated agricultural area covered 570.808 ha. In 2020, almost 25% of Austria's agricultural land is organically cultivated, in some regions up to 30%.

#### Main agricultural production areas

The main agricultural production areas amount "only" 16% of the Austrian territory. The agricultural regions are represented in the graphic below:

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<sup>8</sup> Statistik Austria

[http://www.statistik.at/web\\_en/statistics/Economy/agriculture\\_and\\_forestry/farm\\_structure\\_cultivated\\_area\\_yields/structure\\_of\\_holdings/index.html](http://www.statistik.at/web_en/statistics/Economy/agriculture_and_forestry/farm_structure_cultivated_area_yields/structure_of_holdings/index.html)




**Infografik © Land schafft Leben 2020**  
 Quelle: Corine 1990 (UBA); modifiziert nach Schaumberger, 2005

*Figure 2: AUSTRIA - Land usage – agricultural regions<sup>9</sup>*

dark green = forestry; light green = grassland; brown = arable farming

### Surfaces for main crops

In 2020, the arable land area amounted to 1,32 million hectares, which corresponded to 16% of the Austrian territory.<sup>10</sup> With 764.385 ha (57,9%), cereal cultivation accounted for the largest share of arable land. Feed crops were cultivated on an area of 241.681 ha (18,3%). Oil seed crops covered 166.148 ha (12,6%). Root crops were cultivated on 50.718 ha (3,8%), grain legumes on 18.754 (1,4%). 50.396 ha or 3,8% of arable land lay fallow in 2020. 29.003 ha (2,2%) were used for cultivating special crops, such as vegetables, strawberries, etc.

### Irrigation, mechanization and digitalisation

The latest official statistic on key agricultural and forestry equipment was done 2013 within the Farm Structure Survey. A total of 310.018 tractors were recorded on Austrian agricultural holdings, corresponding to a decrease of 6,5% since 2005. However, the farmers invested in the purchase of more powerful tractors.<sup>11</sup>

Since the purchase of equipment is often unaffordable for the individual farmer, the role of the machinery rings grew in importance. There is also a trend of farmers uniting in cooperatives in order to purchase machinery. In 2013, 50.355 agricultural and forestry holdings (30,3%) used at least one external tractor.

<sup>9</sup> <https://www.landschaftleben.at/hintergruende/flaechen-und-boeden>

<sup>10</sup>: Statistik Austria  
[http://www.statistik.at/web\\_en/statistics/Economy/agriculture\\_and\\_forestry/farm\\_structure\\_cultivated\\_area\\_yields/land\\_use/index.html](http://www.statistik.at/web_en/statistics/Economy/agriculture_and_forestry/farm_structure_cultivated_area_yields/land_use/index.html)

<sup>11</sup> Statistik Austria:  
[http://www.statistik.at/web\\_en/statistics/Economy/agriculture\\_and\\_forestry/farm\\_structure\\_cultivated\\_area\\_yields/machinery/index.html](http://www.statistik.at/web_en/statistics/Economy/agriculture_and_forestry/farm_structure_cultivated_area_yields/machinery/index.html)



Digitalisation is generally growing in importance in Austria. However, again due to the small-scale farms, many technologies are still unaffordable.

Due to climate change, irrigation is growing in importance. However, there are only few irrigation projects planned at the time being.

### **Developments in the use of pesticides and fertilisers**

The medium-term development of the national use of fertilizers until 2030 will be impacted by the measures implemented through the European Green Deal and the Common Agricultural Policy of the EU. The Green Deal follows two strategies in creating a modern, resource-efficient and competitive agriculture: the Farm-to-Fork strategy and the EU's biodiversity strategy for 2030. This sets a focus on organic agriculture and the reduction of the use of pesticides, fertilizers and antibiotics in the agri-food production process. The CAP proposals similarly encourage low-input farming in the EU, with a focus on the conscious use of pesticides, reduction of nitrates from agricultural production and further support of the organic farming.<sup>12</sup>

### **Approach towards GMO**

Austria's strategy about GMO is defined by the Organic farming measure in the Austrian Rural Development Programme (RDP). Austria has a clear approach with respect to GMOs in agriculture. No GMOs can be grown and commercialized in Austria so far. The nine federal provinces have complemented the federal law on GMOs by additional pieces of legislation and protective measures.

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### **Organic farming**

In 2019, the area dedicated to organic farming accounted for 668.725 hectare and made up more than a quarter of the total agricultural area in Austria.<sup>14</sup> 22,2% of all Austrian farms were as organic farms certified. Austria has the highest share of agricultural area farmed organically of all EU Member States.

There are government aids for organic farmers and a strong collaboration with supermarkets in rising awareness of the consumers for organic foodstuffs from regional production.

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<sup>12</sup> Grüner Bericht 2020, Federal Ministry of Agriculture, Regions and Tourism, p. 241 and [https://ec.europa.eu/info/food-farming-fisheries/sustainability/environmental-sustainability/cap-and-environment\\_en](https://ec.europa.eu/info/food-farming-fisheries/sustainability/environmental-sustainability/cap-and-environment_en)

<sup>13</sup> <http://www.un.org> Austria Agriculture

<sup>14</sup> [https://enrd.ec.europa.eu/projects-practice/organic-farming-austria\\_en](https://enrd.ec.europa.eu/projects-practice/organic-farming-austria_en)

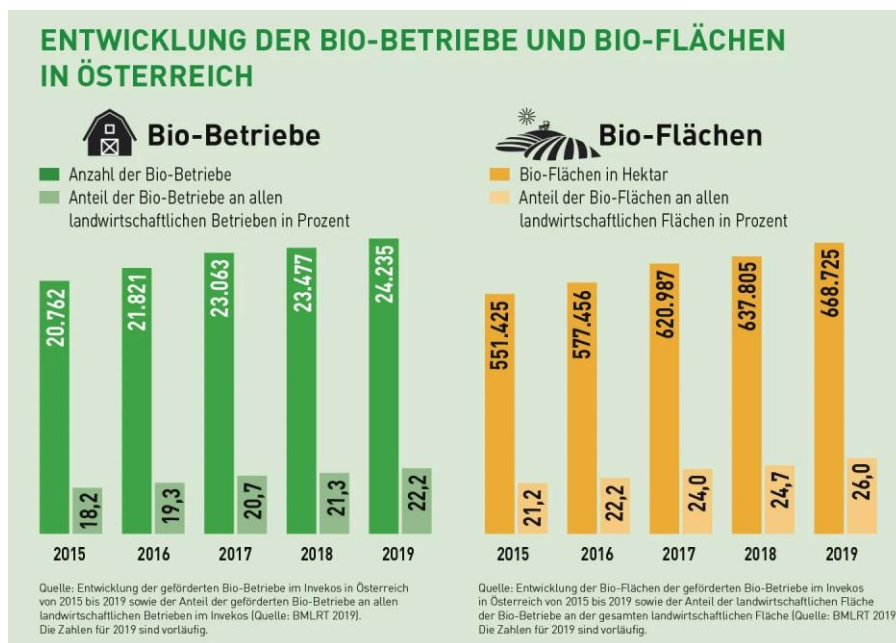


Figure 3: AUSTRIA - Development of organic farms and organically cultivated areas<sup>15</sup>

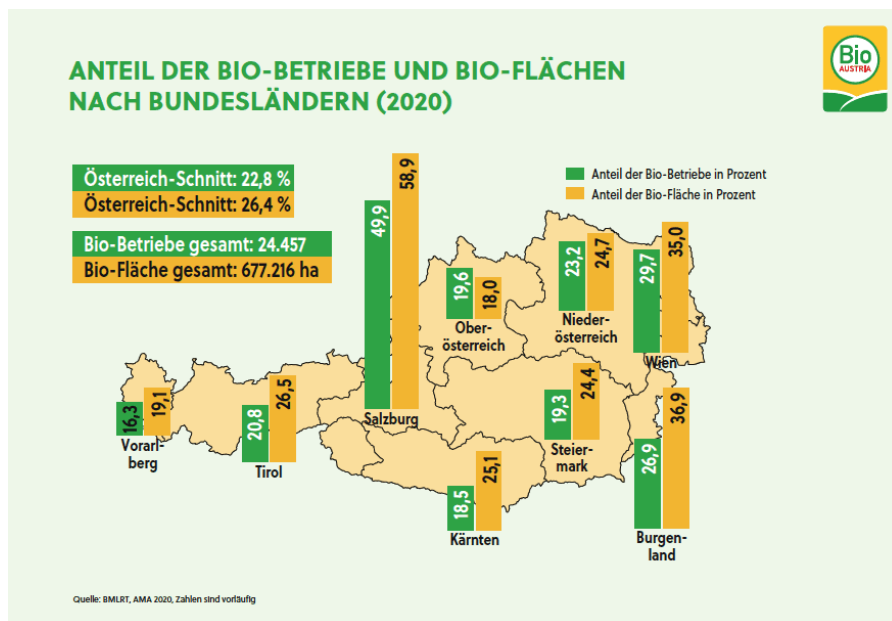


Figure 4: AUSTRIA - Shares of organic farms and organically cultivated areas in the federal states in 2020<sup>16</sup>

<sup>15</sup> <https://www.bio-austria.at/bio-bauern/statistik/>

<sup>16</sup> <https://www.bio-austria.at/bio-bauern/statistik/>



## **BULGARIA**

Agricultural territories cover 5 782 thousand ha, and represent 52.1% of the country's territory (11 099 thousand ha), of which 48-50% are managed as fields, 31% - as pastures, 7-8% as fallow lands, approximately 4% as perennials, while uncultivated land is approximately 8%.

In Bulgaria there is a historically established specialization of agricultural production, expressed in the dominant share of grain – 30-33% of the utilized agricultural area (UAA), which represents about 58% of arable land. There follow the industrial crops (oleaginous and non-oleaginous) – 12-14% of the UAA, vegetable production 2-3%, horticulture and viticulture – about 4%, etc. This structure is generally retained throughout the years, with some fluctuations, according to market demand.

Pastures in Bulgaria, representing about 31% of agricultural land areas (ALA), occupy the most degraded and Eastern productive lands. Bulgarian forests perform multiple economic, environmental and social functions essential for sustainable development. Forests in Bulgaria do not contribute significantly to the development of the national economy (contribution to gross domestic product (GDP) – 0.5%), but they provide financially valuable ecological functions that are hard to evaluate, such as regulation of the water regime in the territories, restricting water erosion, reduction of air pollution.

The land designated for agriculture in 2019 was 5, 222 925 ha, which represents about 47% of the country's territory.

The **utilized agricultural area** (UAA) includes arable land, permanent crops, nurseries, permanent grassland and kitchen gardens. In 2019, it amounted to 5,037,470 ha or 45% of the country's territory, with no significant change from the previous year.

An **arable land** includes areas under which crop rotation is applied, temporary meadows with cereals and legumes, fallow land and greenhouses. In 2019 it decreased slightly (by 0.1%) compared to the previous year, up to 3 461 615 ha, representing 68.7% of the utilized agricultural area.

**Orchards** in 2019 represented 1.8% of the UAA of the country, with the areas occupied by them being 90,221 ha or 1.6% more on an annual basis.

**Vineyards** - axenic culture in 2019 they occupy over 53,005 ha, which is decrease of about 1.5% compared to 2018. The share of vineyards in the UAA of the country is 1.1%.

**Non-cultivated land** includes both abandoned permanent crops and arable land, which have not been used for agricultural production for more than two years, but their operational recovery is possible with minimal resources. In 2019, non-cultivated land occupied about 1.7% of the country's area, decreasing by 5.3% on an annual basis.

Despite the achievements of modern agricultural science and the development of agro technologies, the importance of meteorological conditions for the size and quality of agricultural products cannot be compensated. Agriculture in Bulgaria is carried out under conditions of limited and insufficient moisture.

Climate change affects not only the quantitative but also the qualitative indicators of agricultural production in Bulgaria and other countries. The development of agricultural practices and the application of precision and organic farming require in-depth knowledge of weather and climate, meteorological and climatic features and agro-climatic resources, in order to effectively and timely manage the processes to achieve maximum results.

In the agricultural zone of Bulgaria, the conditions of humidification are limiting, and they are determined by the balance between temperatures and precipitation. The average annual precipitations in Bulgaria are 550-600 mm, which, however, there are extremely unevenly distributed, and during the critical period for agricultural crops, they are extremely insufficient. The problem of water scarcity is becoming more tangible. Bulgaria is relatively poor in surface water resources. According to WWF data from December 7, 2018, they make up only 0.3% of the country's territory, which ranks it among the countries with the least resource in the world. However, Bulgaria falls in latitudes that are sensitive to climate change.

In the last 30 years, weather conditions in Bulgaria have been a prerequisite for natural disasters, both in terms of extreme temperatures and heavy precipitations.

The highest yields of wheat and barley were obtained in the North-Eastern (NE) region and the lowest in the South-Western (SW) region. The highest yields of grain maize, sunflower and rapeseed were obtained in the North-Eastern (NE) and North Central (NC) planning regions, and the lowest in the South-Western (SW) region. The highest yields of alfalfa were obtained in the SC and NC planning regions, and the lowest in the South-Eastern (SE) region. The largest production of all crops, except barley, is concentrated in the North-Eastern (NE) region and the smallest in the South-Western (SW) region. The largest production of barley is concentrated in the South-Eastern (SE) region.

In 2019, damage to crops caused by the following adverse climatic events in Bulgaria was reported: frost, torrential rain (storm), hail and drought.

### **Wheat**

The relative share of wheat in the total harvested cereals during the year is 62%. The largest share of the harvested areas of wheat is occupied by the North-Eastern region - 23%, followed by the North-Western region - 22%.

### **Rye and triticale**

The most harvested areas are observed in the South Central region – respectively with rye 2,339 ha, and with triticale 6,478 ha.

### **Barley**

The largest areas with barley during the year were located in the South-Eastern region (29.7% of the total harvested area in the country), followed by the North-Eastern region (18.9%).

### **Oat**

Most areas with oats were harvested in the North-Western region - 31.9% of the areas harvested with oats in the country.

### **Grain Maze**

The largest share was the share of harvested maize areas in the North-Western region (37.3%), followed by the North Central region (29.1%) and North-Eastern region (26.9%).

## Rice

Harvested husked rice in 2019 reached 71.4 thousand tones, marking an increase of 12.6% compared to the previous year. There was an increase in both the harvested area (by 7.4%) and the average yield (by 4.8%).

## Sunflower

About 25.5% of the sunflower harvested areas during the year were in the North-Western region. North-Eastern region followed with 2.9%.

## Rapeseed

The highest harvested rapeseed areas during the year were reported in the South-Eastern region (39%), followed by the North Central region (23.9%).

**Soil cover in Bulgaria** is characterized by a great variety due to the considerable diversity of soil forming factors (soil forming rocks, strongly uneven relief, different bio-climatic conditions and anthropogenic activity), and has a mosaic structure. It includes 42 soil varieties classified in 16 soil types.

For agriculture in Bulgaria the most important are deep soils located in plain and lowland areas, occupying about 53.2 percent of the country's territory. These include chernozems, dark gray, gray, light gray and cinnamon forest soils, smolnitsa, part of alluvial soils, pseudopodzolic and saline soils.

In 2019, a total of 24,338 (25,208 in 2018) **agricultural and forestry machinery** were registered in the country, of which 7,709 or about one-third was new machines (compared to 8,274 in 2018).

The registration of agricultural and forestry equipment allows to monitor the technical condition of each machine, to control its safety at work and transport, to maintain a database of all machines on the territory of the country, to track the dynamics of renewal of the machine-tractor park and the energy security of agriculture.

## CROATIA

Agriculture (grazing and tilling) occupies less than one-fourth of Croatia's land and contributes less than one-tenth to the country's gross domestic product (GDP). Most agricultural land is privately held, but many landholdings are too small for profitable production. The Croatian agricultural produce is exported mainly to nearby countries, particularly Bosnia and Herzegovina, Italy, Slovenia, and Serbia. Slavonia, the granary of Croatia, is the most fertile agricultural region. Farming there is characterized by capital-intensive, market-oriented production and larger landholdings. Most of the land previously under social ownership has been nationalized by the Croatian government and is leased to farmers.

The major crops of the region are sugar beets, corn (maize), wheat, potatoes, barley, soybeans, sunflowers, and tobacco. Oats, rye, millet, rice, beans, peas, and chicory are also grown. Pigs, cattle, and poultry are important to the economy of the region, while there is also some beekeeping and silkworm breeding. The hills of the western part of the para-Pannonian region are characterized by smallholdings, mixed farming, and generally low yields. Fruit growing, viticulture, and cattle and pig

breeding are typical agricultural occupations. The central mountain belt contains some of the poorest land and climate for agriculture. The large areas of meadow and pasture, however, are suitable for raising sheep and cattle, and there is also some cultivation of barley, oats, rye, and potatoes. Fruits grown include plums, apples, pears, sour cherries, sweet cherries, peaches, and apricots.

The Adriatic littoral of Istria and Dalmatia is characterized by rocky soil and long periods of drought, with small parcels of arable land and poor pasture. Sheep and goats are raised, while grapes, olives, almonds, figs, tangerines, and other Mediterranean fruits and vegetables round out the agriculture of this region. Beekeeping is also of some commercial importance, especially on the islands. Croatia's large forests, covering about two-fifths of the country's area, form the basis of the wood and pulp industry. Fish and shellfish are harvested commercially in the waters off the Adriatic coast, although fish stocks in the sea declined in the late 20th and early 21st centuries. Around nine tenths of the fish catch comprise small oily fish (e.g., anchovies and pilchards), much of which is consumed locally, but there is also an increasing demand for non-oily fish, or white-fish (e.g., sea bass). Aquaculture, or fish farming, is of growing importance, with sea bass, tuna, and mussels all popular. Almost all commercially sold freshwater fish is raised in ponds as well, though freshwater fishing has some significance for tourism. Farmed fish are exported to countries such as Spain and Japan, while canned fish is sold mainly to surrounding countries.

The three different climate zones of Croatia are accompanied by a variety of different soils and thus provide the possibility to grow a large variety of agricultural crops. It appears that the quality of much of the available arable land has been affected by poorly regulated, intensive agrochemical use over a sustained period. Generally, the quality of land in the Pannonia region is much better than those in Mountainous and Mediterranean Regions. According to the 2013 agricultural census, 68% of total agricultural land is arable land and 26% is permanent grassland. The agricultural census defines the different categories as follows:

- Agricultural Land includes: arable land and gardens, kitchen gardens, meadows, pasture, nurseries, orchards, vineyards and land with basket willow (osier).
- Arable land and gardens are land which is regularly farmed and cultivated and is under crop rotation. The following are grown on arable land and in gardens: cereals, potatoes, leguminous plants, oilseeds, tobacco, sugar beet, forage crops, fibrous plants, aromatic and medicinal herbs, vegetables, flowers and horticultural plants, and sowing and seeds and seedlings. Arable land and garden areas include fallow land.
- Fallow land is land, which is used in the crop rotation system and left to recover for a whole crop year. Fallow land covers uncultivated land and gardens during one vegetation year and can bear no crops at all or can have natural growth for feed. It does not include mined agricultural land, which is part of the unutilized agricultural land.
- Unutilized Agricultural Land is agricultural land, which is no longer farmed for economic, social or other reasons. Neither is it used for crop rotation. This land could be re-transformed to utilized agricultural land.

## REPUBLIC OF MOLDOVA

According to NBS data, on 01.01.2020, the land fund constituted 3384.7 thousand ha, including agricultural land, 2492.1 thousand ha, which represents approx. 73.6%, of which 1841.9 thousand ha arable land (73.9%), and 15.4% of these are covered by multiannual plantations (see Table 3). The typology of land ownership has three main classes of ownership: state property (22%), local public authority ownership (20%) and private property (58%). Currently, about 94% of agricultural land is privately owned.

The level of land fragmentation has not changed significantly since the privatisation process, which ended in 2000. Data from the general agricultural census, carried out in 2011, show that an agricultural holding, on average, is divided into 3 parcels. Currently, less than 1% of registered collective households manage more than 61% of agricultural land in production. The average land size is about 0.8 ha. Land consolidation continues to be a critical factor for the well-being of the rural population. Less than 6% of agricultural land has been estimated to be unworked.

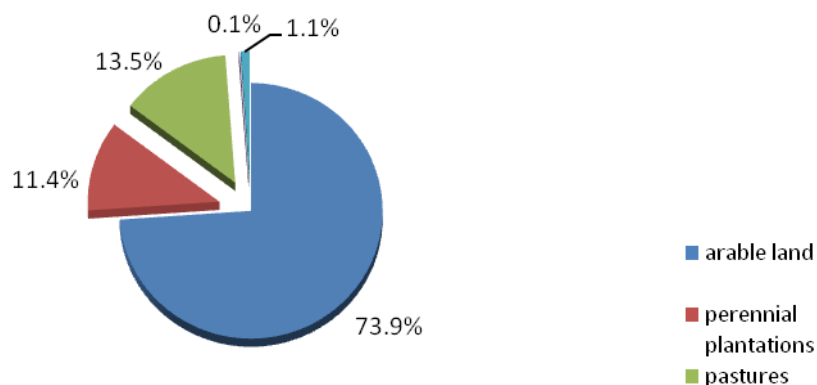


Figure 5: REPUBLIC OF MOLDOVA - Structure of agricultural area by use, as of January 1, 2020 %

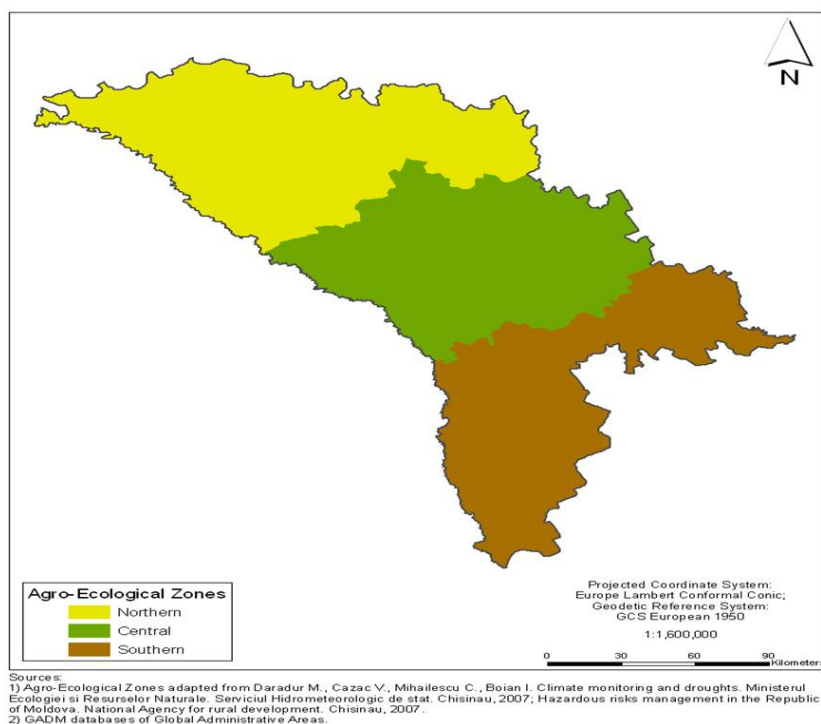
The analysis of areas sown with agricultural crops, by categories of households in 2019, according to NBS data, shows the following:

- agricultural enterprises hold the highest share in the case of: cereal and leguminous crops 51 %, industrial crops 71,4 %;
- peasant (farmer) households hold the highest share in the case of: forage crops 42%, cereal and leguminous crops, grains approx. 28% and industrial crops 25.8%;
- households hold a share of 21% in the case of cereal and leguminous crops and 2.8% in the case of industrial crops.

The territory of the Republic of Moldova can be divided into three agro-ecological zones. The areas included in each of these agro-ecological zones have the same characteristics in terms of terrain, climate, soil type and water availability. The North Agroecological Zone is a hilly area with forests, steppes and meadows, where the most fertile soil is found with high water retention capacity, being the most suitable for field crops. The Central agroecological area is hilly and has deep valleys, where the soil is less fertile and is best suited for perian crops such as orchards and vineyards. And the South agroecological area has steppe and meadow land with both, very fertile and less fertile soils.



Due to high temperatures and low rainfall, this area has only marginal production in the absence of irrigation.

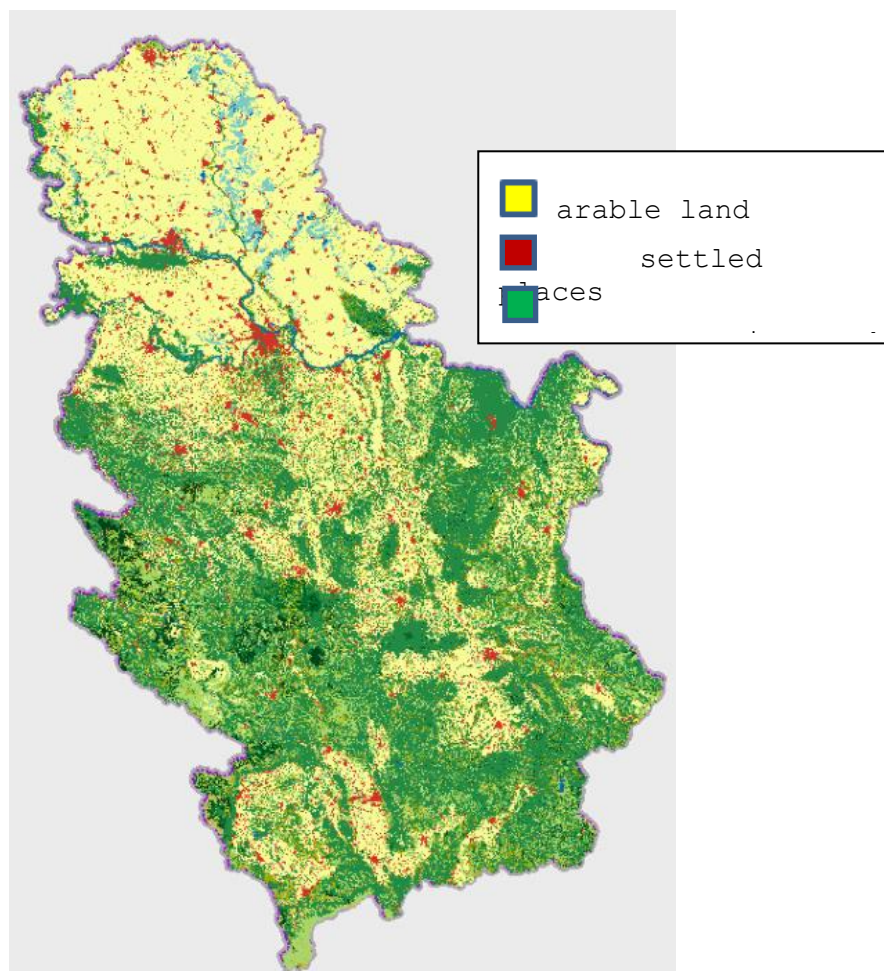


*Figure 6: REPUBLIC OF MOLDOVA - Agroecological zones*

Soil quality has decreased by 5 points over the past 30 years as a result of intensive exploitation in the absence of necessary pedological measures. The low level of crop rotations (reduction of fodder crops with legumes), 30-fold reduction in the use of organic fertilisers and 15-fold reduction in mineral fertilisers profoundly affected the amount of humus and bioelements in the soil, leading to its biological degradation. The phosphorus content in most soils is between 1,8 and 2,1mg/100g of soil and is at the boundary between low and moderate gradation. The general potassium content of the soils of the Republic of Moldova is favorable, offering the possibility to obtain high yields on 90% of agricultural land. The decrease in soil quality is becoming a critical problem for the Republic of Moldova and, in combination with the consequences of different types of erosion, leads to a decrease in the productivity of agricultural crops and the efficiency of agricultural production on large areas of land.

## REPUBLIC OF SERBIA

Serbia produces various agricultural products, mostly grains, fruits and vegetables which constitute a significant part of its GDP and exports. Agriculture in Serbia is an important sector of the Economy of Serbia comprising 6.0% of GDP and is valued at 2.416 billion euros (as of 2017).



*Figure 7: REPUBLIC OF SERBIA - Land cover map*

Agricultural land occupies some 65% of the total area of Serbia, equivalent to approximately 5.7 million hectares. Of this, arable land totals 3.3 million hectares (65% of agricultural land), orchards cover an area of 2.4 million hectares (5% of agricultural land), vegetable production covers 295,000 hectares and vineyards 70,000 hectares (1% of agricultural land). Permanent grasslands cover 1.4 million hectares, equivalent to 28% of agricultural land.<sup>17</sup>

Agricultural production is mostly present in the northern province of Vojvodina on the fertile Pannonian Plain (45% of all used arable land), and the southern lowlands adjacent to the Sava, Danube and Great Morava rivers.

Crop production is growing considerably. Cereals dominate crop production, accounting for 45% of arable land, or 60% of the total cultivable land. The most important cereals are wheat and maize, whereas only 10% of the area under cereals is used for the production of rye, barley and oats.

Compared to other sectors of the Serbian economy, the agro-food sector plays a very prominent role in overall trade, accounting for some 20% of total exports. Serbia's main export commodities are

<sup>17</sup>[https://www.sepa.gov.rs/download/ae\\_programme\\_for\\_serbia.pdf](https://www.sepa.gov.rs/download/ae_programme_for_serbia.pdf)



cereals (maize, wheat), raw and processed fruit (frozen raspberries, prunes), refined sugar and some livestock and meat products.

Serbia is a significant producer of maize (6,158,120 tons, ranked 32nd in the world) and wheat (2,095,400 tons, ranked 35th in the world). The production of sugar beet (2,299,770 tons) and sunflower seeds (454,282 tons) meets domestic demand for sugar and vegetable oil and permits the export of some 180,000 tons of sugar to the European Union.

It is estimated that around 1.1 million people in Serbia (15.70% of total population) is employed on agricultural farms, with around 530,000 being employed in farms all year long (as of 2018). As of 2018, there is a total of 564,542 agricultural farms in Serbia, of which the vast majority of 99.7% are traditional family farms.

Export trade structure according to the destination of trade: European Union 47,6%, CEFTA 43,6%, and 8,8% other countries. The top 10 agricultural products in export are: corn, white sugar, raspberry, wheat, sunflower oil, edible and raw, beer made from malt, fresh apples, soft drinks, griz raspberry and soybean oil.<sup>18</sup>

According to the annual report of the Association of Grains of Serbia, the total export of all cereals and oilseeds during 2019 amounts to 4.3 million tons.

When it comes to the most represented world crop culture, the record export of corn in 2019 in the amount of 3,117,958 tons, is a consequence of the good yield of corn for two years in a row, 2018 and 2019, but also uniform exports throughout 2019. Of the 3,117,958 tons exported, 2,216,245 tons were shipped by the Danube, which is 71.08% of total exports (58.33% last year). Most of the corn was exported to Romania, Italy and Austria.

### **GMO-Free country**

Serbia is a country free from Genetically Modified Organisms (GMO). It adopted a GMO Act in 2009. This law strictly forbids the import, production or commercial growing of GM crops. The Law also bans the import of GMO related products like soybean meal produced from GM crops, which contributes to higher local feed prices. At the same time, there is no allowed system in place for non-GMO certification and labelling of local non-GMO products in Serbia, thus not making the difference visible between locally produced non-GMO food products and imported, significant quantities of meat, milk and other animal based products coming from GM fed animals.

The GMO Law is not in conformity with the EU regulations nor with the rules of the World Trade Organization (WTO). In order to become a member of these two organizations, Serbia will need to adjust the current law.

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<sup>18</sup> Ministry of Agriculture, Forestry and Water management / [www.minpolj.gov.rs](http://www.minpolj.gov.rs)

## SLOVAKIA

Agricultural production in 2018 was at the level of less than 2,200 mil. EUR, ie by 700 mil. EUR lower than in 1990, when it exceeded 2,900 mil. EUR. Significant, in a negative sense, is decline in the volume of agricultural production, agricultural production per 1 hectare of utilized agricultural area, which is 1 178 EUR, which is only 50 percent of the EU-28 average. All disproportions in the development of agriculture and the food industry over the last thirty years have ultimately been negatively reflected in the development of agri-food foreign trade and in the share of Slovak products on the domestic market, which in 2018 was in the dairy industry 59 percent, in meat 36, in poultry 47, in mill 61, in bakery 22 and in the brewing-malting industry 70 percent. Therefore, the most of agricultural products are exported from Slovakia and finished food products with higher added value is imported. Foreign trade balance with agricultural products is roughly balanced, but the balance of foreign trade food products is minus 1.6 billion EUR for their imports for more than 3.5 billion EUR. 79% of total food imports are substitutable commodities, that could be produced in the country. Among the enterprises of the supply-customer chain primary production-processing-trade, are manifested significant differences in the capital strength of individual entities and the degree of concentration in favor of retail.

According to Report on agriculture and food in the Slovak republic for 2019 The economic results of agricultural holdings in 2019 were influenced by several income-cost and production factors, namely:

- faster decrease in revenues (by 7.3%) than costs (by 6.9%) contributed to a decrease in cost-effectiveness,
- decrease in the production performance of the industry, i.e. gross agricultural output at current prices (by 4.0%) and crop production (by 2.2%), but especially animal production (by 6.9%),
- decrease in sales of own products (by 10.8%) due to a more significant decrease in total sales of crop products (by 18.4%) and a slower increase or even stagnation of sales of animal products (by 0.2%),
- increase in prices of agricultural products (by 1.8%), especially crop products (by 1.4%) and slight decrease in prices of animal products (by 0.3%); with the largest increase in prices for potatoes by 38.1% and from animal products for pigs for slaughter (by 4.8%),
- increase in prices of cost factors due to price increases (by 2.2%), especially prices of fertilizers and soil improvers (by 9.6%), electricity (by 7.5%), animal feed (by 3.1%), seeds and seedlings (by 1.4%),
- increase in support (by 11.9%) due to their increase from EU resources (by 9.1%) and national resources of the Slovak Republic (by 19.8%), due to a faster increase in funds from direct payments (by 9.4%) and a slower increase from the RDP SR 2014-2020 (by 4.6%),
- the continuing trend of dominance of the share of plant (62.8%) over animal (37.2%) production,
- decrease in hectare yields of most crop commodities with an impact on stagnation to a decrease in their natural-mass production, especially corn for grain (by 4.7%), sugar beet (by 4.6%), oilseeds (by 15.5%), feed root crops (by 15.0%) and fruit (by 19%),

- an increase in the number of workers (by 20.9%), and thus in labor costs, in connection with the increase in the area of field crops and horticultural areas,
- negative impact of weather during the growing season, extreme drought affecting the intensity of production across the regions of Slovakia (especially the production southwest) with an impact on livestock production (bulk forage), glaciers, torrential rains and overpopulation of game and voles,
- low interest rates with an impact on the growth of total loans (by 22.4%), and interest costs,
- the application of rationalization measures by procuring high-performance techniques and technologies with regard to the structure and development of agricultural production with an impact on total and seasonal agricultural employment,
- rent for the lease of agricultural land (with a share of 2.6% of total costs),
- risk management of price effects on production, by selling agricultural commodities at pre-agreed prices through future trade,

## HUNGARY

Changes in the structure of land use can be observed in the longer term. The size of arable land (4.3 million acres) and orchard area (94 thousand acres) has not changed significantly since 2010. The area of vineyards (grapes) (68 thousand acres), kitchen gardens and reed beds has been significantly reduced. The size of forest (1.9 million acres), turf (790 thousand acres) and uncultivated land (2 million acres) increased slightly.

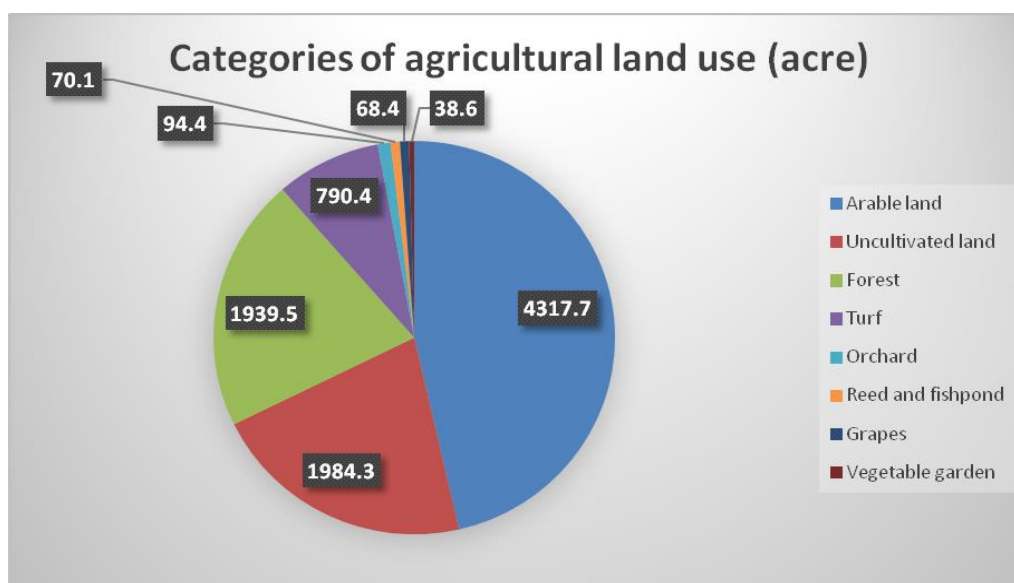


Figure 8: HUNGARY - Categories of agricultural land use (acre)<sup>19</sup>

<sup>19</sup> Source: [A mezőgazdaság teljesítménye \(ksh.hu\)](http://mezogazdasag.teljesitménye.ksh.hu)

In Hungary, similarly to almost all EU countries, the use of GMO crops is allowed mostly in the case of imported fodder crops. In accordance with this, Hungary has introduced regulation [53/2006. (XI. 29.) OGY], and from 1 January 2012 Article XX. of our new Constitution also covers it.

A mezőgazdaság jövedelmezősége\* és a főbb növénycsoportok kibocsátása alapján, régióként, 2018

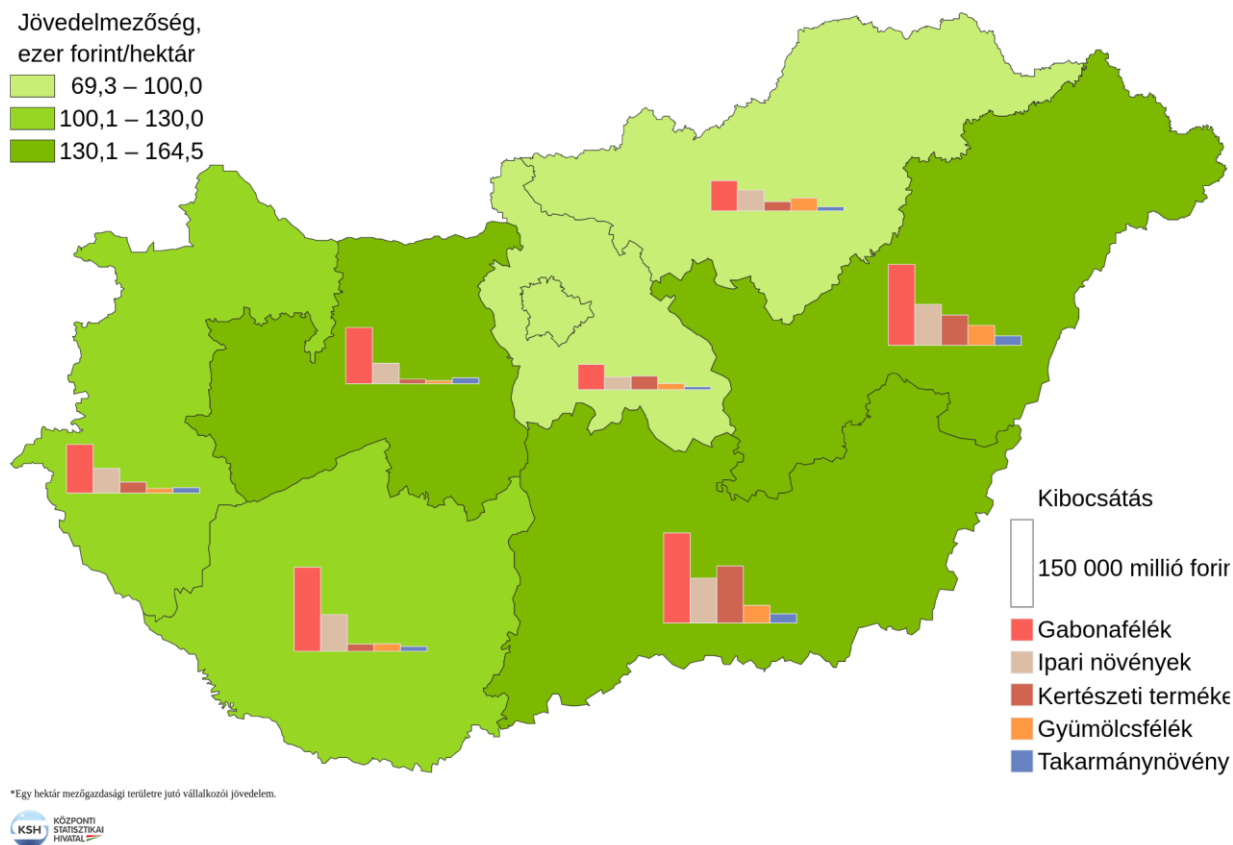


Figure 9: HUNGARY - Profitability of the different counties' agriculture production by product groups, 2018<sup>20</sup>

In 2018, the value of entrepreneurial income per acre of agricultural land averaged HUF 133,000. The regional values of the specific indicator varied on a wide scale (HUF 60 and 170 thousand): it was exceptionally high in the Southern and Northern Great Plain, it was around the average in Central Transdanubia, and lagged behind the average in the other regions. The two regions yielding high above the average together accounted for almost half (46-48%) of total crop and livestock output, 52% of fruit production and 66% of horticulture production.

<sup>20</sup> Source: [Helyzetkép a mezőgazdaságról, 2019 \(ksh.hu\)](http://helyzetkep.a mezogazdasagról.2019 (ksh.hu))

### 3.3 Uncertainty analysis

Every outlook exercise carries its uncertainties, whether geopolitical, macroeconomic or simply related to unforeseen events or changes. The baseline projections presented in the report is based on a set of plausible assumptions that are the result of consulting market experts, scientific research and literature reviews. In this sense, the projections reflect the ‘most likely’ path of market developments.

If it is to give an example, crop markets are in general strongly affected by uncertainties like high uncertainty of oil price, exchange rates, particular climate conditions like severe drought which conduct to uncertainty of the yields etc. Due to the fact that uncertainties can be common but on the same time different and depending by geographical factors, the PP's has been invited to elaborate on this.

Therefore, there be presented first the general<sup>21</sup> assumptions on EU level, followed by the considerations within PP's countries.

The baseline assumptions and projections are based on consultations with internal and external market experts, researchers and forecasters. They reflect the consensus view of market developments resulting from underlying market drivers and trends. While it is acknowledged that any projection represents just one out of infinitely many possible trajectories, not all of these possible outcomes are equally likely to occur. The results from the ‘uncertainty analysis’ quantify the likely range of market outcomes around the consensus view.

Factors that affect commodity markets can be grouped into those that mainly affect supply and those that mainly affect demand. Market uncertainty is assumed to derive from macroeconomic and yield developments deviating from their baseline trajectories. The yields and macroeconomic variables can be considered as proxies for the numerous underlying drivers affecting supply and demand. More specifically, the assessed variables include gross domestic product (GDP), inflation, the exchange rate and the international crude oil price, representing the price of energy, as well as crop yields.

#### **Highly uncertain oil prices and exchange rates**

The baseline assumes the oil price to be USD 83/bbl in 2030. However, oil price projections are notoriously uncertain and the range of likely values is between USD 44/bbl and USD 113/bbl.

Energy prices affect agricultural markets through several channels. They affect production costs, the purchasing power of consumers and biofuel demand. High oil prices, for example, drive up production costs and reduce the purchasing power of consumers. High oil prices also reduce demand for fuel in general, but increase the competitiveness of biofuels. The net effect on the demand for biofuel feedstocks depends on market specifics in different countries, including the biofuel policies in place.

The baseline assumes that the exchange rate will appreciate slightly from 1.12 USD/EUR in 2021 to 1.16 USD/EUR in 2030. Factoring in uncertainty, its value is likely to range between 1.08 USD/EUR and 1.24 USD/EUR in 2030. A higher exchange rate implies a stronger euro than in the baseline. A stronger euro reduces the competitiveness of the EU production – a higher price of EU products in US dollar leads to lower exports, while a lower price of foreign products in euro attracts higher imports.

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<sup>21</sup> Here and follow: EC (2020), EU agricultural outlook for markets, income and environment, 2020-2030. European Commission, DG Agriculture and Rural Development, Brussels



### **Uncertainty of commodity price resulting from macroeconomic and yield uncertainty**

There is a relationship between the uncertainty of the factors affecting supply and demand (oil prices, exchange rates, yields, etc.) and the uncertainty of agricultural commodity prices. As an example, the price uncertainty of grains results from the uncertainty of the underlying supply and demand shifters. Even if the market trends lead to a price that follows the solid line, this will probably not be the exact actual outcome. What we can say with reasonable certainty is that the price will end up somewhere between, if the assumptions about the underlying market trends turn out to be correct.

The main macroeconomic drivers of market uncertainty are the crude oil price and the exchange rate. The crops with the most uncertain yields are rye, maize, sugar beet, soya bean and sunflower, although there are significant differences between Member States in Western Europe and Central Europe.

### **Assumptions for ‘slow recovery’ and ‘green recovery’ scenarios**

The global economic contraction caused by the COVID-19 pandemic in 2020 is the sharpest on record. Policy measures introduced to contain the pandemic, including lockdowns in most EU Member States, led to short-term disruptions in local and global food value chains, including threats of shortage of labour and of trade frictions. However, the resilience of the EU food systems and the quick policy answers meant that the risk of adding a food crisis on top of the sanitary crisis was avoided. The medium-term impacts of COVID-19 are still uncertain and will depend on the economic recovery pathways.

The baseline projections for the EU agricultural outlook are based on selected macroeconomic and policy assumptions (for PP's countries see also Chapter 3.1 Policy and macroeconomic framework above). In light of the considerable macroeconomic uncertainty due to the COVID-19 pandemic, two scenarios were prepared based on alternative economic recovery pathways. Both assume effective vaccines become widely available by the summer of 2021. In the first, ‘slow recovery’ scenario, a resurgence of COVID-19 infections considered the round of lockdowns that was present in Q4 of 2020 and Q1 of 2021, while fiscal support measures are assumed to be phased out gradually, hampering the early stage of recovery. In the second, ‘green investments’ scenario, a policy shift is envisaged in the wake of the COVID-19 crisis, encouraging research and investments in energy efficiency and fuel switching. This lowers the demand for energy in general and fossil fuels in particular and puts downward pressure on energy prices. Both scenarios are global, i.e. based on specific projections for major world economies.

### **GDP- and oil price assumptions in the baseline and scenarios**

Without COVID-19, the EU economy was expected to increase by 15% between 2019 and 2030. Due to the pandemic, the COVID-19 baseline has been revised downwards to 10% in the current baseline including the COVID-19 shock (an annual difference of 4.5 percentage points in 2022-2030). In the ‘slow recovery’ scenario, the contraction assumed in 2020 is steeper, and the subsequent sluggish recovery brings GDP in 2030 to only a few percent higher than in 2019. The ‘green investments’ scenario, characterized by slightly higher growth (in oil-importing countries), results in an EU GDP level in 2030 slightly above baseline (but still well below the pre-COVID baseline).

In the baseline, the international oil price in 2030 is projected at 82 USD/bbl (28% above 2019). In the ‘slow recovery’ scenario, lower demand, resulting from lower incomes, reduces this projected increase of the oil price to 72 USD/bbl (13% above 2019). In the ‘green investments’ scenario, the oil price reaches 52 USD/bbl in 2030 (18% lower than in 2019). This decline is mainly driven by demand for transport fuel, which in 2030 is 20% lower in the ‘green investment’ scenario than in the ‘slow recovery’ scenario.

## Impacts on agricultural markets

The higher the decline in the economy's incomes (measured by GDP), the higher is the negative impact on demand and, subsequently, on prices. The production impact, including agricultural supply, depends on the level of the demand shocks in the EU and in other countries, as well as their relative difference (a higher drop in domestic demand improves EU competitiveness and increases foreign demand for EU exports). In some cases, the additional foreign demand offsets lower domestic demand, and EU production may increase.

Lower energy prices lead to lower production costs for agricultural commodities and thus to higher supply. However, lower conventional fuel prices make biofuels less competitive and reduce their demand, while lower fuel demand reduces the demand for biofuel used in blends.

The combined effect of the GDP, oil price and fuel consumption shocks in the scenarios translates into a price decrease in most agricultural markets and a large price decrease in the biofuels and feedstock markets.

As to the specific markets:

- The supply and demand shocks lead to significantly lower grains prices in the two scenarios compared with the OECD-FAO baselines.
- Lower demand for fuel in the 'green investments' scenario, combined with lower oil prices and income, results in lower producer prices and lower production of biodiesel and rapeseed than in the baseline. Lower domestic demand for rapeseed causes imports to decrease strongly. The large domestic price fall competitive, increasing by around 20%.
- The sizeable domestic price decrease, on the other hand, with diverse responses to shocks in various countries, leads to an increase in net exports.

In general, market impacts are mostly driven by the macroeconomic shock, in particular the GDP contraction in 2020 (rather than the oil price and fuel consumption shocks). The main exceptions are biofuels and feedstocks in the 'green investments' scenario, where most of the market impacts are caused by changes in fuel consumption.

Findings by country as follows:

### AUSTRIA

Besides climate change, important risk factors influencing agricultural production and, ultimately future food availability, include the availability and price development of necessary inputs such as fossil fuels, highly uncertain oil prices and exchange rates, protein feedstuff and Phosphorus (P-) fertilizers, uncertainty of commodity price resulting from macroeconomic and yield uncertainty.<sup>22</sup>

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<sup>22</sup> Food self-sufficiency in Austria: simulation results for 2030 and 2050 C. Tribl, J. Hambrusch and K. Mechtler, 2015, p. 78



## **BULGARIA**

Following strong EU commitment to act upon climate change, the Bulgarian government started in 2016 developing its *National Climate Change Adaptation Strategy and Action Plan (NASAP)*, counting on the knowledge and expertise of the World Bank (WB). The WB's team of experts prepared an assessment of climate change related risks in nine economic sectors: agriculture, biodiversity and ecosystems, energy, forestry, human health, tourism, transport, urban development, and water.

Climate threats for Bulgaria are imminent with an expected average temperature rise of up to 4oC by 2100. Also, precipitation patterns will change.

The agriculture sector is specifically vulnerable to climate change, showing a variety of potential impacts. At the same time, there will be certain opportunities to benefit from the changes. Climate change impacts on agriculture include crop yields and crop quality, agricultural productivity, changes in the length of the growing season, livestock yield, soil aridity, erosion, salinization, land losses and loss of income.

Extreme weather events and climate anomalies have a strong impact and can compromise yields and/or reduce the quality of output. In the future, spring crops sown on infertile soils will be increasingly vulnerable, as well as the arable land in southeaster Bulgaria where the precipitations even under the current climate conditions are insufficient to ensure normal growth, development, and yield of crops. Rising concentration of CO<sub>2</sub> in the future might create conditions to improve the yields of major crops; however, this potential increase in yields may be hindered by the increased risk of drought, as well as shortening duration of the reproductive period due to increases in air temperatures. There will be a shift in the dates of maturity of different crops, variations of the growing periods, and changes in their yields.

Among the measures that can be taken to reduce the vulnerability of Bulgarian agriculture to climate change are changes in types of crops and soil optimization.

## **CROATIA**

Croatia's agricultural development has been strongly and negatively affected not only by structural changes following the break-up of the former Republic of Yugoslavia (50% of land was previously farmed by large, vertically and horizontally integrated agricultural holdings), but also by major demographic changes caused by the war.

**Important agriculture and rural development opportunities are embedded in the macro trends and issues that are shaping the future of Croatia's agri-food sector.** The overall performance of Croatia's agri-food sector is affected by several changing socio-economic, market, environmental, policy, and technological conditions.

Leveraged under future sector strategies and plans to advance the shared vision of success:

**Growth and Employment:** Croatia's primary and food processing sectors have generally demonstrated a negative growth performance in recent years, whereas the rest of the EU displayed generally positive growth. Croatia has demonstrated a strong potential to generate economy-wide effects on value addition and employment creation.

**Trade and Consumption:** While export values of agri-food products have increased in aggregate, Croatia's agri-food trade balance in primary products and, especially, in processed food and beverage products has been worsening over the past decade.

**Climate Change and Environmental Sustainability:** Increasing climate variability and change are expected to have growing impacts on future agri-food sector performance. Such changes are projected to adversely affect yields and result in soil degradation, resistant cycles of pests and diseases, agro-biodiversity loss, recurrent droughts and forest fires.

**Climate Change and Environmental Sustainability:** Increasing climate variability and change are expected to have growing impacts on future agri-food sector performance.

Such changes are projected to adversely affect yields and result in soil degradation, resistant cycles of pests and diseases, agro-biodiversity loss, recurrent droughts and forest fires

**Regional and Territorial Development:** Rural areas, where primary agriculture accounts for a large share of land use and livelihoods, continue to be closely associated with high poverty rates, especially in Eastern Slavonia. Strengthening these intra- and cross-sectoral linkages could therefore help unlock broad-based growth, improve incomes, and generate jobs in rural areas by diversifying the rural economy in an inclusive manner.

**Results-Based Management:** Future support programs financed under the CAP must be re-oriented towards addressing national context-specific challenges and delivering positive impacts.

**Technology and Innovation:** Technological developments in genetics, nano and precision technologies, remote sensing, traceability (blockchain), (big) data analytics, the internet of things, artificial intelligence, robotics, e-commerce, etc. are creating increasing opportunities to raise productivity, lower costs, reduce risks, improve value addition, and develop new markets for Croatia's agri-food sector.

Every outlook exercise carries many uncertainties. This is especially evident this year, when the **COVID-19** pandemic has led to a sharp drop in economic activity around the world. Moreover, the impact of the economic contraction observed this year is not just a short-term phenomenon.

**Highly uncertain oil prices and exchange rates:** Energy prices affect agricultural markets through several channels. They affect production costs, the purchasing power of consumers and biofuel demand. High oil prices, for example, drive up production costs (represented as an upward shift of the supply curve) and reduce the purchasing power of consumers (a downward shift of the demand curve).

## **REPUBLIC OF MOLDOVA**

The agri-food sector of the Republic of Moldova may face the following uncertainties/risks:

1. The agricultural production of the Republic of Moldova is completely dependent on agrochemicals, seeds and fuels, which are imported, which affects the competitiveness of its agri-food products. This dependence exposes the agriculture of the Republic of Moldova to the volatility of international prices.
2. Insufficient access to quality inputs remains a constraint on competitiveness in several sub-sectors. Agricultural producers rely largely on imported seeds and propagating material and are most affected by lengthy and costly varietal registration procedures. The same factor is also an obstacle to access quality inputs for agri-food processing undertakings.

3. Macroeconomic: fiscal policy, lack of sustainable financing, lack of a clear mechanism for price formation.
4. Natural disasters (including droughts, floods, hail, frosts and severe storms) can contribute to a decrease in production in the agricultural sector, and annual losses are estimated at 3.5 to 7.0% of the country's GDP.
5. The high volatility of agricultural production reflects the poor development of risk mitigation instruments caused by weather conditions, including limited access to irrigation, and a low adoption rate of modern agronomic practices and technologies. At the same time, innovative insurance systems are lacking in agriculture.
6. Decrease in population numbers as a result of reduced birth rate, migration, ageing.
7. Decrease in soil creditworthiness as a result of the failure to administer organic fertilisers on time and in full volume, failure to respect the rotation of agricultural crops, failure to comply with the technological process.
8. Infrastructure: insufficient storage of agri-food products, processing of poorly developed agricultural products, transport.

## **REPUBLIC OF SERBIA**

Due to climate change, the weather is becoming volatile and unpredictable. In South-Eastern as well as in Central Europe, winters are now milder, spring weather is dry and turbulent, and summers are scorching hot. Plant cultivation is vulnerable, and droughts as well as floods can cause serious damages.

Floods usually affect farms and crop plantations in the vicinity of rivers and other water flows. Farms at those locations do not have high irrigation expenditures but on the other hand, insurance risk is too high.

The average age of tractors on Serbian farms is more than 30 years, forcing the government to change traffic safety laws in 2019.

The results achieved by Serbian agriculture are far behind the average of the EU27 countries, as well as from available potential for development. Economic policy did not show a strategic approach towards the development of agriculture, leading to several negative consequences, especially in the rural part of the country. The unfavourable age structure of the rural population and generally small farm estates are among the largest issues that burden the national agriculture and family farms.

Main logistical bottlenecks for grains in Serbia:

- Railways in bad state of repair (low maximum weight load and speed with only about half of the railway tracks allowing for speeds over 60 km/h);
- Significant problems in river fleet (limited number of old and inefficient vessels) and the infrastructure of internal waterways downstream;
- Still limited number of intermodal grains terminals;

## **SLOVAKIA**

Slovakia's accession to the European Union has contributed to strengthening farmers' incomes. Nevertheless, the share of agriculture in the gross value added of the Slovak economy is at the level of the contribution of arts, entertainment and recreation. Both sectors contribute 3.4 percent to Slovakia's value added.

In 1989 prices, in the revolutionary year, support for Slovak agriculture reached the level of 600 million euros. Already in 1991, it was about 350 million euros at that year's prices. After 1993, support for agriculture amounted to just over EUR 200 million. This is stated in the Annual Reports on Agriculture and Food. The change occurs only after Slovakia's accession to the European Union.

Since 2011, we have documented positive changes in profitability in all years, except 2013, which was slightly loss-making due to price declines in the global and European agricultural commodities market. The highest level of profit was achieved in the last three years. The paradox was 2017, which was marked by the effects of climate change, especially drought, but the economic result for 2017 was the highest not only in the last five years, but also in the entire history of agriculture after 1990. Mandatory tax contributions also contributed to profitability 2014-2017. licenses for legal entities

Before joining the European Union, districts with loss-making agricultural enterprises predominated in the regions of Slovakia. In 2003, only fifteen Slovak districts were profitable. In 2018 it was up to 55 districts. Farms are optimizing costs and replacing live work with high-performance agricultural technology by improving the material and technical base. However, this requires high input costs, but subsequently saves labor costs in the long run, including contributions, which is reflected in the decrease in the number of employees since Slovakia's accession to the EU by almost half from 86.6 thousand to the current 44 thousand people.

## **HUNGARY**

The agriculture is heavily dependent on fossil fuels (oil and gas), because they are used as raw materials and energy sources in the manufacture of fertilizers and pesticides, as well as cheap and readily available energy sources at all stages of food production: from planting, irrigation, feeding and harvesting, through processing, distribution to packaging. In addition, fossil fuels are essential in the construction and the repair of equipment and infrastructure needed to facilitate this industry, including farm machinery, processing facilities, storage, ships, trucks and roads. The industrial food supply system is one of the biggest consumers of fossil fuels and one of the greatest producers of greenhouse gases.

The agriculture is dependent on the exchange rates because of the import needs in the sector. Since the beginning of 2020, the Hungarian Forint has seen an increase in inflation. This tendency is now also affected by the continuous stock market plunge caused by the crisis, with its exchange rate continuing to fall. This also has an effect of driving up food prices.

Severe drought in 2020 April:

The April of 2020 could be among the three driest Aprils – after 2007 and 1946 - in the period starting in 1901. No significant amount of precipitation has arrived in Hungary since mid-March, and the monthly precipitation in April is far below the usual. The prolonged drought and sometimes windy weather with severe spring frosts is not just a challenge for the agriculture.

Permanently dry weather reduces the moisture content of the soil, but it can also deplete our surface water resources and the water level of our rivers. This water shortage can cause problems in several parts of the country, including problems with the supply of drinking water, irrigation, industrial processes, energy production and even waterborne transport.

## 4 Main agricultural products and inputs

### 4.1 Cereals

Farming practices on a transition path to lead to stable cereal production by 2030

Total EU cereal area is expected to decrease to 51.0 million ha in the 2020-2030 decade. This is mainly driven by significant declines in durum and barley areas, where the downward trend continues. Soft wheat area is also expected to slightly go down. Total EU wheat area could reach 21 million ha in 2030 (-1.6% compared to 2020). The main producing countries have been reducing their share of wheat in the total cereals area in recent years (for example in France and Germany), while Poland is increasing its wheat area. Concerning maize, the total area should expand across the EU and could reach 8.8 million ha to meet the increasing feed and industry demand. The share of other cereals (oats, rye, sorghum and others) is expected to remain stable in order to meet the growing demand for food and feed purposes.

Cereal yields should continue to increase thanks to improved research and innovation, as well as enhanced farming practices and crop management. Crop rotation systems, improved soil management and increased usage of decision support tools should support yields. At the same time, growth in yields will be limited in regions where yields are already high and in regions facing environmental constraints. Owing to increasing yields, cereal production is expected to remain stable at 278.1 million t.<sup>23</sup>

Within this context, the analysed "Assessment of growth potentials for main agricultural products" Country reports (chapter 4.1 Cereals) was focused on area and yield developments results in total production, dynamics of domestic consumption; covering of the consumption from domestic production and / or imports, trade - Intra-Community trade and exports / imports outside EU, also medium-term outlook, based on available data and forecasts.

The main elements identified, by country, are found in the following, while details are found in each of the country reports.

### AUSTRIA

#### Area and yield developments

In 2020, the total area under cereal cultivation decreased by 1.5% compared to previous year and reached 764.385 ha.<sup>24</sup> In the table below there is an overview of the acreage development between 2012 and 2020:

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<sup>23</sup> EC (2020), EU agricultural outlook for markets, income and environment, 2020-2030. European Commission, DG Agriculture and Rural Development, Brussels

<sup>24</sup> Statistik Austria:  
[http://www.statistik.at/web\\_en/statistics/Economy/agriculture\\_and\\_forestry/farm\\_structure\\_cultivated\\_area\\_yields/land\\_use/index.html](http://www.statistik.at/web_en/statistics/Economy/agriculture_and_forestry/farm_structure_cultivated_area_yields/land_use/index.html)



*Table 1: AUSTRIA - Development of the cultivation areas of the main cereals in 2012 - 2020<sup>25</sup>*

Cultivated areas in ha									
	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>Durum wheat</b>	14.251	12.338	14.048	19.057	23.229	22.892	21.905	16.703	16.515
<b>Common wheat incl. spelt</b>	293.730	284.699	290.493	283.651	291.885	272.138	270.747	260.588	261.359
<b>Rye</b>	48.528	56.099	48.242	39.527	37.406	34.476	40.723	43.680	42.699
<b>Winter barley</b>	77.841	78.485	81.934	87.519	89.063	85.959	92.691	101.567	103.473
<b>Sommer barley</b>	72.690	64.044	63.897	64.123	51.342	52.944	46.582	35.673	31.038
<b>Barley total</b>	150.531	142.529	145.831	151.642	140.405	138.903	139.273	137.240	134.781
<b>Oats</b>	24.812	23.169	23.301	23.472	22.526	23.244	21.452	20.597	20.130
<b>Triticale</b>	43.741	44.999	51.313	53.670	54.835	55.235	56.682	59.823	56.204
<b>Corn maize</b>	199.021	233.018	216.398	198.927	188.745	202.756	202.019	211.630	203.445

The total cereals yield incl. corn maize amounted 5,67 million tons (+5% compared to year 2019) and without corn maize 3,26 million tons.

The wheat harvests amounted 1,66 million tons (+ 3% compared to 2019). Durum wheat incl spelt accounted for 1,58 million tons and registered an increase of 4% compared to 2019.

Spelt experienced a strong area expansion and achieved excellent yield per hectare with 54.100 tons (+34% to 2019), while durum wheat is a slightly below average harvest of 79.300 tons (-2% to 2019).

Rye yields were above average and resulted in 219.200 tons (+9% compared to 2019).

Corn maize yields were also above average and resulted in a +5% production quantity compared to 2019, despite a decrease of the cultivation area (-4% compared to 2019).

### **Dynamics of domestic consumption**

With regards to cereals, Austria reached in year 2018/19 a degree of self-sufficiency of 87 %.<sup>26</sup> In year 2019/20 the domestic consumption was of about 3,791 million tons of which 0,759 million tons

<sup>25</sup> AgrarMarkt Austria <https://www.ama.at/Marktinformationen/Getreide-und-Olsaaten/Kennzahlen>

for food and 0,756 million tons for feed. 1,583 million tons were used for production of starch, citric acid and in breweries.

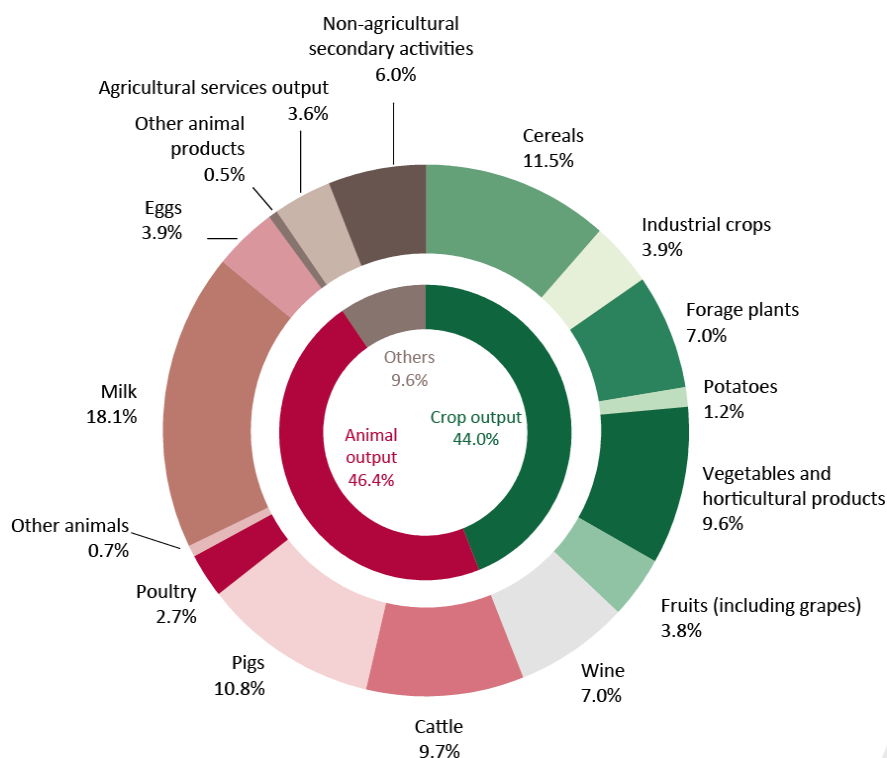
### Imports and exports

In year 2019, Austria imported approx. 2,3 million tons of cereals and exported approx. 1,18 million tons. Most trade partners are EU-countries.<sup>27</sup>

Austria exported 673.700 tons of wheat, as follows: 71% to Italy, 17% to Germany and 4% to Switzerland. Austria imported 899.200 tons of wheat, as follows: 43% from Hungary, 32% from the Czech Republic, 14% from Slovakia and 7% from Germany.

Austria exported approx. 400.300 tons and imported 1,9 million tons of corn maize. 77% of the exported corn maize went to Italy and approx. 11% to Germany. 46% of the imported maize came from Hungary, 24% from Serbia and 12% from Slovakia.

**Composition of the output value of the agricultural industry in 2020**



S: STATISTICS AUSTRIA, Economic Accounts for Agriculture. Compiled on 12 February 2021.

*Figure 10: AUSTRIA - Output value of agricultural industry in 2020*

<sup>26</sup> Grüner Bericht 2020, Federal Ministry of Agriculture, Regions and Tourism, p. 26ff

<sup>27</sup> Grüner Bericht 2020, Federal Ministry of Agriculture, Regions and Tourism, p. 31ff

## BULGARIA

In 2019, as a whole, there is an increase in the production of the main cereals in the country compared to the previous year, with the exception of rye. Higher average yields were reported for all cereals except grain maize.

Table 2: BULGARIA - Cereal production `2018 and` 2019 Harvest Years<sup>28</sup>

Crop	Harvested areas			Average yield (tones/ha)			Production (tones)		
	2018	2019	Change 2019/2018	2018	2019	Change 2019/2018	2018	2019	Change 2019/2018
Wheat	1 212 012	1 198 682	-1,1%	4,81	5,14	6,8%	5 832 449	6 161 997	5,7%
Rye	8 316	6 097	-26,7%	1,66	1,93	16,7%	13 776	11 793	-14,4%
Triticale	15 171	15 199	0,2%	2,66	2,84	6,9%	40 306	43 173	7,1%
Barley	103 570	112 029	8,2%	4,22	4,89	15,6%	437 507	547 244	25,1%
Oat	11 339	12 153	7,2%	2,14	2,51	17,1%	24 308	30 518	25,5%
Grain maize	444 623	560 911	26,2%	7,82	7,11	-9,1%	3 478 013	3 990 190	14,7%
Rice	11 004	11 822	7,4%	5,76	6,04	4,8%	63 415	71 415	12,6%

According with Bulgaria Country report, and with table above, the situation by crops are as follows:

### Wheat

In 2019, wheat production amounted to 6,162 thousand tones, which is 5.7% more than in 2018, due to the relatively favourable climatic conditions in the process of crop development, which led to an increase in average yield (by 6.8%).

The wheat-sown areas under for the `2098 yield were 1,201,678 ha, 1.3% less than the previous year. Of these, 1,198,682 ha were harvested.

According to data from the BSMAEC survey of the Agrostatistics Department, in 2019 wheat was grown following wheat crop on 7.5% of the area, compared to 6.4% in 2018.

On about 91.7% of the areas with wheat harvest `2019, a good crop rotation was carried out.

### Rye and triticale

The grain produced from rye harvest `2019 amounted to 14.4% below the level of the previous year, as the decrease in the harvested areas by 26.7% is partially compensated by an increase in the average yield.

<sup>28</sup> Source: MAFF, Agrostatistics Department, Yields of Crops Survey

With relative preservation of the harvested areas and increase of the average yield by 6.9%, the production of triticale increased by 7.1% on an annual basis.

### **Barley**

Barley production in 2019 amounted to 547,2 thousand tones. This represents an increase of 25.1% on an annual basis, as a result of an increase in both harvested areas - by 8.2% and the average yield - by 15.6%.

Compared to its predecessors, a good crop rotation was made on about 74.6% of the barley area.

### **Oat**

Oat production increased by 25.5% compared to 2018, which is due to the larger size of harvested areas and higher yields per hectare. The average yield increased by 17.3% compared to the previous year.

### **Grain maize**

In 2019, maize production increased by 14.7% compared to the previous year, to 3,990,1 thousand tones. This is due to an increase in harvested areas by 26.2%, while the average yield for the country decreased by 9.1%.

Similar to the previous years, in maize, the largest was the share of precursor wheat - 51.2%. The barley included in the maize crop rotation in 2019 was 3.6%.

### **Rice**

Harvested husked rice in 2019 reached 71.4 thousand tones, marking an increase of 12.6% compared to the previous year. There was an increase in both the harvested area (by 7.4%) and the average yield (by 4.8%).

## **CROATIA**

Croatia has 1.3 million hectares (ha) of agricultural land. In addition, Croatia has about 2.2 million ha of forests. Croatia is self-sufficient in the production of wheat, corn, poultry, eggs, and wine, while still having favorable conditions for the production of many other agricultural products. Nevertheless, imports of agricultural and food products continue to grow. Although agriculture only contributes approximately 4 percent to GDP, the importance of agricultural production is higher than its GDP share indicates. The vast majority of Croatia is rural territory (92 percent) and about half of Croatia's population lives in rural areas.

Given the small average farm size and the fractured nature of the farms, restructuring policies in Croatia are particularly important. As many as 63.1 percent of all registered farms have fewer than three hectares, while the average commercial farm is 8.5 hectares. Currently Croatian agriculture struggles with land ownership, the size of farms (which are small due to family inheritance laws), and outdated land registry books.

During the period 2008 to 2012, cereals were produced on an average of 559,916 hectares and production on average totaled 3,137,702 tons. According to the data of the CBS (Central Bureau of

Statistics of Croatia), the cereals sector contributes some 20% to the overall Croatian GAO or 34% to the crop production– a relatively small share compared to the share of arable land that it takes.

The main reasons for Croatian cereals productions not being competitive compared to European agriculture are small farms, small scale of production as well as technological problems (e.g., seeds and outdated machinery).

Barley	<b>278,600</b> tonnes in 2019
Buckwheat	<b>624</b> tonnes in 2017
Coarse Grain	<b>2,500,442</b> tonnes in 2018
Green Maize	<b>858,058</b> tonnes in 2017
Maize	<b>2,298,320</b> tonnes in 2019
Millet	<b>171</b> tonnes in 2017
Oats	<b>58,250</b> tonnes in 2019
Paddy	<b>0</b> in 2019
Rye	<b>6,990</b> tonnes in 2019

*Figure 11: CROATIA - Output value of agricultural industry in 2020*

Cereals dominate crop production in Croatia, accounting for about 64% of total arable land. Maize and wheat are the most important commodities in the cereals sector. Barley, the third biggest commodity generates only some 4% of the accumulated GAO (Gross Agricultural Output) of these three commodities.

### **Barley**

Croatia's barley output increased roughly 15% to almost 280,000 tonnes in 2019, with the yield per hectare climbing to 5.1 tonnes from 4.5 tonnes in 2018, the official statistics available indicated.

According to the available statistics provided by the FAO and Knoema, Croatia had 53.660 hectares or about 536 squared kilometres of disposable area for barley production which resulted in producing of 278.600 tonnes of barley in 2019. The yield was 51.919 hectogrammes per hectare.

When talking about foreign trade activities and barley as an important cereal for Croatia, import of barley burdained the republic by almost \$3 million USD, while the export represented 36.714 tonnes which is roughly about 40 million HRK (\$6.35 million USD).

### **Maize**

Maize is Croatia's biggest single commodity with a production of 1.297.590 t in 2013, which was produced on approximately 400,000 ha (CBS data). Croatia's maize production contributes significantly to marketable production in Western Balkan countries and is one of the few Croatian

commodities that generate a trade surplus. While not competitive with major Central European exporters such as Hungary, Croatian maize is nevertheless competitive in neighboring Bosnia and Herzegovina, Macedonia and the Republic of Montenegro.

Croatia Agricultural Production Yield: Late Crops: Maize data was reported at 9.000 ton/ha in 2019. This records a decrease from the previous number of 9.100 ton/ha for 2018. Maize data is updated yearly, averaging 5.220 ton/ha from Dec 1980 to 2019, with 39 observations. The data reached an all-time high of 9.100 ton/ha in 2018 and a record low of 3.670 ton/ha in 1992.

Overall trend is increasing following a fairly regular trend where we approximately 1-2 years of a clear downtrend followed by the 1-2 years of a uptrend. Incremental or decrements range approximately by 18-50%.

Wheat is the second biggest commodity in the Croatian cereals sector and, according to FAO wheat is the fourth biggest single commodity in Croatian agriculture. Same as in maize, Croatia is self-sufficient in producing wheat. With WTO Croatia agreed as part of a much wider trade liberalization process the reduction of tariff duties on wheat import. In 2012, 186,949 hectares were harvested, on which were produced 999,681 tons of wheat, while the yield per hectare was 5.3 tones.

Croatia Agricultural Production Yield: Early Crops - Wheat data was reported at 5.600 ton/ha in 2019. This records an increase from the previous number of 5.400 ton/ha for 2018. Wheat data is updated yearly, averaging 4.210 ton/ha from Dec 1980 to 2019, with 40 observations. The data reached an all-time high of 5.900 ton/ha in 2017 and a record low of 2.960 ton/ha in 2003.

The yield per hectare rose to 5.5 tonnes in 2019 from 5.4 tonnes in 2018. The designated area for wheat production in Croatia amounted to 143.150 hectares with the production of 803.270 tonnes of wheat.

According to the foreign trade statistical outlook, export of wheat cereal amounted to \$67 million dollars, while the import statistics presented the result of 122.725 tonnes in 2019. According to the average price of wheat in 2019 of 1.111,57 HRK/ton, import amount of wheat aggregated to 136.4 million HRK or about \$21.65 million USD.

## **REPUBLIC OF MOLDOVA**

According to official data, in 2019, the Republic of Moldova produced 3498.7 thousand tons - cereal crops, including wheat - 1147.5 thousand tons (32.8%), corn - 2129, 9 thousand tons (60.9%) and barley – 168.1 thousand tonnes (4.8%). Imports of cereal crops amounted to 112.8 thousand tonnes, which constitutes approx. 3.2% of the total resources available.

During 2019, cereal crops by volume of 3537.2 thousand tonnes were used, including (a) export 1361.3 thousand tonnes (38.5%), of which wheat – 564.1 thousand tonnes (41.4%) and corn – 737.6 thousand tonnes (54.2%), (b) feed – 1548 thousand tonnes (43.8%), of which wheat – 176.1 thousand tonnes (11.4%) and corn – 1228.8 thousand tonnes (79.4%), (c) personal consumption of the population 503 thousand tonnes (14.2%), of which wheat – 453.5 thousand tonnes (90.1%) and corn – 29.3 thousand tonnes (5.8%).



## **Wheat**

Data shows that wheat production in 2019 recorded a volume of 1147 thousand tonnes representing an increase of 2.3 times compared to 2012 (495), and a decrease of 16 thousand tonnes compared to 2018 (1163), the year in which the largest harvest was recorded in the last 8 years.

During the reference period the volume of wheat exports increased steadily with some fluctuations. Thus, in 2019 564 thousand tonnes were exported, representing an increase of 53 thousand tonnes compared to 2018 (511) and a decrease of 119 thousand tonnes compared to 2017 (683).

During 2012-2019, the volume of personal consumption of the population remained stable with some fluctuations. Thus, the lowest consumption was recorded in 2016 (373) and the highest consumption in 2012 (470). In 2019 the personal consumption of the population was 453 thousand tonnes, representing an increase of 10 thousand tonnes compared to 2018 (443) and a reduction of 17 thousand tonnes compared to 2012.

## **Maize**

The analysis of the information shows that corn production increased steadily during the period 2012-2019. Thus, in 2019 was registered the largest corn harvest - 2130 thousand tonnes representing an increase of 3.7 times compared to 2012 (572), and an increase of 56 thousand tonnes compared to 2018 (2074).

During the reference period the volume of corn exports increased steadily with some variations. Thus, in 2019 738 thousand tonnes were exported, representing an increase of 151 thousand tonnes compared to 2018 (511) and an increase of 18 times compared to 2012 (41).

During the period of analysis, the volume of personal consumption of corn of the population remained stable with some fluctuations. Thus, the lowest consumption was reported in 2012 (22) and the highest consumption in 2017 (40). In 2019 the personal consumption of the population was 29 thousand tonnes, representing a decrease of 3 thousand tonnes compared to 2018 (32).

## **Barley**

Data shows that barley production was modest. The highest harvest was registered in 2016 (256) and the lowest in 2012 (118). In 2019 168 thousand tonnes were harvested, representing a decrease of 9 thousand tonnes compared to 2018 (175).

During 2012-2019, the volume of barley exports varied steadily. Thus, in 2019 were exported 40 thousand tonnes less than in 2018 (94). The highest export volume was reported in 2017 (165).

During the reference period, the volumes fluctuated. The lowest consumption was registered in 2013 (42). In 2019 109 thousand tonnes were used for feed, representing an increase of 17 thousand tonnes compared to 2018 (92) and 7 thousand tonnes respectively compared to 2012 (102).

In terms of demand and price on the regional market, it is expected that by 2030 it will increase:

- the area sown with wheat up to 370 thousand ha and the overall production will reach about 1300 thousand tonnes taking into account that the average fruit will oscillate from 3,1 to 3,8 t/ha,
- the area sown with maize for grains up to 500 thousand ha, and the overall production will reach approx. 2250 thousand tonnes in view of the fact that the average harvest will range from 3.3 to 5.6 t/ha;

- the area sown with barley up to 75 thousand ha and global production will reach about 225 thousand tonnes taking into account that the average harvest will oscillate from 2.7 to 3.3 t/ha.

The analysis of the structure of vegetal production, by categories of households in 2019, according to NBS data, shows the following:

- agricultural enterprises hold the highest share in the case of: cereal and leguminous crops 52,6 %, sugar beet approx. 91% and 70% respectively - sunflower;
- peasant (farmer) households hold 27% share in the case of cereal and leguminous crops, sunflower;
- households hold a share of 20.4% in the case of cereal and leguminous crops and 2.9% in the case of sunflower.

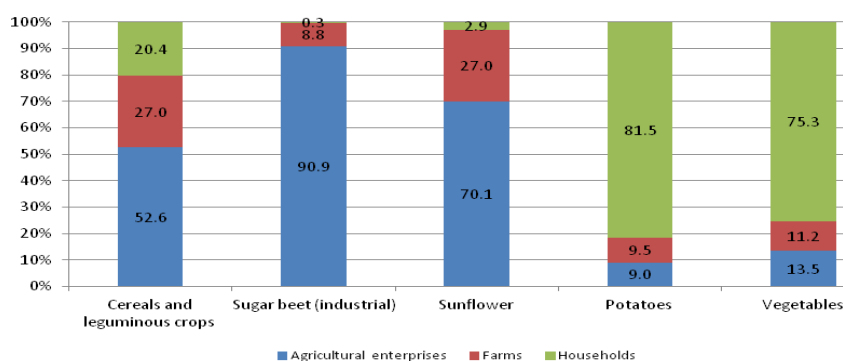


Figure 12: REPUBLIC OF MOLDOVA - Structure of vegetal production, by categories of producers in 2019 (in % to the total volume of production)<sup>29</sup>

The analysis of external trade tendencies, according to NBS data, shows a negative course in the foreign trade balance in the period 2013-2019. Thus, in 2019, the Republic of Moldova recorded a deficit in the foreign trade balance of -3063.3 million U.S. dollars, representing an increase of US\$9.4 million compared to 2018 (-3053.9), which is due to the increase in imports.

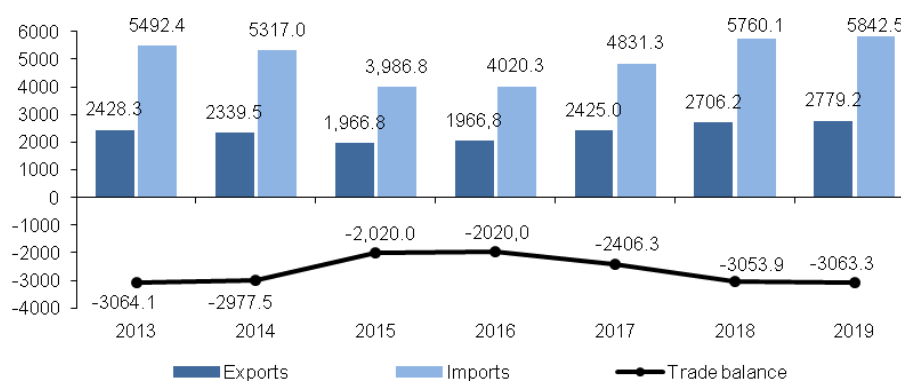


Figure 13: REPUBLIC OF MOLDOVA - Trends of external trade of goods, million USD<sup>30</sup>

<sup>29</sup> Source: BNS (2020)

<sup>30</sup> Source: BNS (2020)

## REPUBLIC OF SERBIA

In 2019, cereals production for Serbia was 10.5 million tonnes. Though Serbia cereals production fluctuated substantially in recent years, it tended to increase through 2010 - 2019 period, ending at 10.5 million tonnes in 2019.

Grain farms cover around 1,702,829 hectares of arable land in Serbia (as of 2018), making 66.22% of total used arable land.<sup>31</sup>

Table and figure below gives a preview of prevalent planted cereals species by area and achieved production (as of 2019).

Grain	Hectares (as of 2019)
<a href="#">Maize</a>	962,083
<a href="#">Wheat</a>	577,499
<a href="#">Rye</a>	5,046
<a href="#">Barley</a>	100,118
<a href="#">Oat</a>	22,669

Table 3. REPUBLIC OF SERBIA - Planted areas of cereals

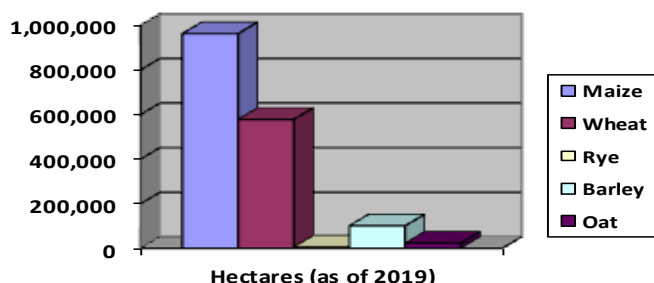


Figure 14. REPUBLIC OF SERBIA - Planted areas: Maize, Wheat, Rye, Barley and Oat

### Wheat

In 2019, wheat production for Serbia was 2,5 million tonnes. Out of 318,868 tonnes of exported wheat during 2019, 70,600 tonnes were prepared by the Danube, which is only 22.14% of total exports, last year 600,000 tonnes, or 50% of total exports. Total domestic consumption of wheat in Serbia for 2019/20 is estimated to be approximately 1,8 million tonnes annually.

In 2020, wheat production for Serbia was 2,8 million tonnes. Though Serbia wheat production fluctuated substantially in recent years, it tended to increase through 2006 - 2020 period ending at 2,8 million tonnes in 2020. Yield per hectares increased from 4.1 ha/t in 2017 to 4.9 ha/t in 2020.

<sup>31</sup>"Анкета о структури пољопривредних газдинстава, 2018. – Земљиште" (pdf). *stat.gov.rs* (in Serbian). Retrieved 22 September 2019.

Wheat is mostly exported to North Macedonia (34%), Bosnia and Herzegovina - BiH (21%) and Albania (17%).

The main factors influencing trends in Serbian wheat production are as follows:

- Competition from other field crops (corn, sunflower, barley, soy), which for the past few years have been more profitable than wheat;
- Wheat is practically the only winter crop grown in Serbia and therefore plays a significant role in the sowing structure for crop rotation purposes;
- Serbia is still a low wheat quality supplier to the EU, but for the last few years with increasing use of foreign wheat varieties, the quality and yields have been improving;
- Rising wheat production (in terms of both area and yields) especially in Russia, Ukraine and Kazakhstan;

### **Maize**

In 2017, maize production for Serbia was 4 million tonnes. Though Serbia maize production fluctuated substantially in recent years, it tended to increase through 2006 - 2020 period ending at 8 million tonnes in 2020. In 2020 planted area for corn was approximately 970,000 ha, an increase of 10 percent compared to last year and 20 percent compared to the past ten-year average.

Serbia's 2019/20 total consumption requirement is estimated at approximately 4.3 million tonnes annually, with most being used for animal feed. Serbia is one of the largest corn exporters in Europe and, in record good years, among the top ten countries in the world.

The record export of maize in 2019 in the amount of 3,117,958 tonnes is a consequence of the good yield of corn for two years in a row, 2018 and 2019, but also uniform exports throughout 2019. Of the 3.1 million tonnes exported, 2.2 million tonnes were shipped by the Danube, which is 71.08% of total exports (58.33% last year).

Harvested area, drastically growth total production from 4 million tonnes in 2017 to 7.87 million tonnes in 2020. Also yield increase by 100 percent, from 4 ha/t in 2017 to 7.9 t/ha in 2020.

Maize is mostly exported to Romania (61%), Italy (21%) and Austria (9%).

### **Rye**

In 2020, rye production for Serbia was 4,725 tonnes. Yield per hectares increased from 2.4 ha/t in 2017 to 3.2 ha/t in 2020. Total production increase from 11,248 tonnes in 2017 to 15,240 tonnes in 2020.

### **Barley**

Barley is a secondary grain crop in Serbia. Total barley consumption for the past five years has ranged between 300,000-400,000 tones, of which around half is for animal feed and half for the brewery industry. Consumption of brewery barley has been increasing due to constant demand from breweries. Barley planted for brewery use continues to expand every year.

Barley production for Serbia increase from 305,493 tonnes in 2017 to 490,115 tonnes in 2020. Yield per hectares increased from 3.3 ha/t in 2017 to 4.6 ha/t in 2020.

Barley is not a significant commodity in Serbia’s overall grain trade. With increased planted area, exports of barley have increased, while imports declined. In 2018/19 Serbia exported a record high quantity of 67,744 tonnes. Exports are mostly to EU countries, Bosnia and Herzegovina and Montenegro.

### Oats

Oats production for Serbia decrease from 69,538 tonnes in 2017 to 52,135 tonnes in 2020. Harvested area is reduced from 28 thousand hectares in 2017 to 17 thousand hectares in 2020.

## SLOVAKIA

The production of cereals<sup>32</sup> in the marketing year 2020-21 is expected to amount to 4,427.4 thousand. tons and compared to the previous period could be higher by 323.3 thousand. tons (by 7.9%). Together with the initial stocks of 2,054.4 thous. tons, estimated other sources 24.0 thousand. tons and estimated imports of 90.6 thousand. tons, the total supply of cereals in the Slovak Republic could reach 6,596.4 thousand in the 2020-21 season. tons. Compared to the previous marketing year, the total supply of cereals is expected to be higher by 233.6 thousand. tons (by 3.7%). In the financial year 2020-21, 2,770.5 thousand are expected to be consumed on the domestic market. tons of cereals, t. j. by 85.4 ths. tons more (by 3.2%) than in the previous period. In the period 2020-21, it is expected to consume 1,068.0 thousand for food purposes. tons of cereals, which would be 9.4 thousand. tons (by 0.9%) less than in the marketing year 2019-20. In the 2020-21 marketing year, about 952.2 thousand are consumed for feed use. tons of cereals, which would mean a reduction of 0.7 thousand compared to the previous marketing year. tons (by 0.1%).

Table 4: SLOVAKIA - Cereals overview 2015-2019

Crop	Parameter / Year	2015	2016	2017	2018	2019
Wheat	Harvest area	377 899	416 578	373 667	403 372	406 821
	Harvest (t)	2 082	2 434	1 770	1 927	1 939
	Harvest per ha (t)	134	213	659	926	133
Barley	Harvest area	5,51	5,84	4,74	4,78	5,00
	Harvest (t)	139 994	114 970	120 329	124 163	126 732
	Harvest per ha (t)	668 644	584 602	545 284	486 898	599 557
Maize	Harvest area	4,78	5,08	4,53	3,92	4,74
	Harvest (t)	191 438	184 811	187 812	179 033	194 244
	Harvest per ha (t)	929 233	1 710	1 066	1 515	1 444
Oats	Harvest area	4,86	9,25	5,68	8,47	7,33
	Harvest (t)	15 880	13 592	14 821	12 928	12 088
	Harvest per ha (t)	43 014	35 591	34 937	29 874	31 901
		2,71	2,62	2,36	2,31	2,64

<sup>32</sup> Situation and outlook report - Cereals , National Agricultural and Food Centre, Research Institute of Agricultural and Food Economics, ISSN 1338-483X, 11/2020



## **Wheat**

Wheat is the most widespread agricultural crop in Slovakia. On average, the last ten years has grown on an area of 365 thousand. hectares. It is grown in virtually all regions from lowlands to mountains. As with other crops, the success of its cultivation depends mainly on climatic and soil environmental conditions. These factors decisively influence the production and economic assumptions of this crop. At the level of 30 thousand hectares are sown in the districts of Levice and Nové Zámky, at a level of over 20 thousand. hectares in the districts of Komárno and Dunajská Streda, at the level of over 10 thousand hectares in the districts of Nitra, Trnava, Košice, Galanta, Trebišov, Michalovce and Rimavská Sobota. The smallest areas of this crop are in the district of Kysucké Nové Mesto under 100 hectares.

At present, the production potential of our soils in winter wheat cultivation is used only at 75.6%. There are considerable reserves, especially in the correct placement of this crop in the conditions that suit it best.

## **Barley**

The sown areas of barley in Slovakia in the marketing year 2020-21 amounted to 132.9 thousand. ha, which means an increase of 6.0 thousand compared to the previous marketing year. ha (by 4.7%). The average hectare yield of barley in the growing period 2020-21 is estimated at 5.01 tons. Compared to the previous period, it would be higher by 0.27 tons / ha (by 5.7%). The production of barley in Slovakia in the marketing year 2020-21 is estimated at 665.6 thousand. ton, t. j. by 66.0 ths. tons (by 11.0%) higher than in the season 2019-20.

It is estimated that when stocks include 21.6 thousand. tons and estimated imports of 70.0 thousand. tons, the total supply of barley in the marketing year 2020-21 could amount to 757.2 thousand. tons. The volume of barley supply would be by 19.9 thousand. tons (by 2.7%) higher than in the previous marketing year. Domestic consumption of barley in the period 2020-21 is expected in the amount of 576.0 thousand. tons, which compared to the financial year 2019-20 would mean a decrease of 35.6 thousand. tons (by 5.8%). The food industry is likely to consume 309.0 thousand during the 2020-21 marketing year. tons of barley, which would be 27.5 thousand. tons (by 8.2%) less than in the previous period. In animal production in the marketing year 2020-21, the consumption of barley is estimated at 175.0 thousand. tons, which would mean by 6.4 thousand. tons (by 3.5%) less than in the previous marketing year. Other consumption of barley is expected to amount to 55.0 thousand. tons, which compared to the financial year 2019-20 represents a decrease of 2.3 thousand. tons (by 4.0%).

## **Maize**

In the 2020-21 marketing year, maize for grain in Slovakia was sown on an area of 196.6 thousand. ha, which is an area of 1.8 thousand. ha (by 0.9%) less than in the previous growing year. The average yield per hectare is estimated at 7.77 tons, which is 0.44 tons (6.0%) higher per hectare yield compared to the period 2019-20. The SO SR estimates the production of maize in the growing year 2020-21 in the amount of 1,529.1 thousand. tons and in comparison, with the size of production in the previous period, this represents an increase of 84.3 thousand. tons (by 5.8%). Together with stocks at the beginning of the marketing year in the amount of 1,792.8 thous. tons estimated imports in the amount of 5.0 thousand. tons and other sources 9.0 thous. tons, the total supply of maize in the 2020-21 marketing year could amount to 3,335.9 thousand. tons. Compared to the previous marketing year, the supply of maize on the Slovak market would increase by 63.0 thousand. tons (by



1.9%). In the marketing year 2020-21, the total consumption of maize is estimated at 1 043.7 thousand tons of corn, which would represent an increase of 23.3 thousand tons (by 2.3%). Food consumption of corn is estimated at 315.0 thousand tons (by 1.6%) higher than in the marketing year 2019-20. Animal production during the period 2020-21 consumes about 347.7 thousand tons of corn, which would be 1.3 thousand tons (by 0.4%) more than in the marketing year 2019-20.

### **Oats**

In the 2020-21 marketing year, oats were sown in Slovakia on an area of 13.4 thousand ha, which in comparison with the previous growing season represents an increase of 0.6 thousand ha (by 4.7%). The average yield of oats in the growing year 2020-21 is estimated at 2.77 tons / ha and in comparison, with the previous period higher by 0.13 tons / ha (by 4.9%). Slovak farmers expect an oat crop of 37.2 thousand tons (by 5.3 thousand tons (by 16.6%) higher than in the marketing year 2019-20. Together with loan stocks 47.0 thousand tons and estimated imports of 0.1 thousand tons, the total size of the supply of oats on the Slovak market in the marketing year 2020-21 is estimated at 84.3 thousand tons. Compared to the previous marketing year, the supply of oats on the Slovak market would be higher by 12.9 thousand tons (by 18.1%).

Consumption of oats in Slovakia in the marketing year 2020-21 is estimated at 26.6 thousand tons, which would be compared to the previous period by 5.4 thousand tons (by 26.0%) more. An estimated 2.0 thousand tons is consumed for food use, ie the same quantity as in the 2019-20 marketing year. It is assumed to consume 18.0 thousand tons for feeding purposes, t. j. by 4.3 thousand tons (by 31.4%) more than in the marketing year 2019-20.

### **HUNGARY**

Hungary's total cereal production in 2020 was 15.3 million tonnes from 2.3 million hectares which is 421 thousand tonnes less than in the previous year. The area of cereals has been steadily declining since 2014. 55% of the country's cereal production came from maize, 33% from wheat and 9.4% from barley.

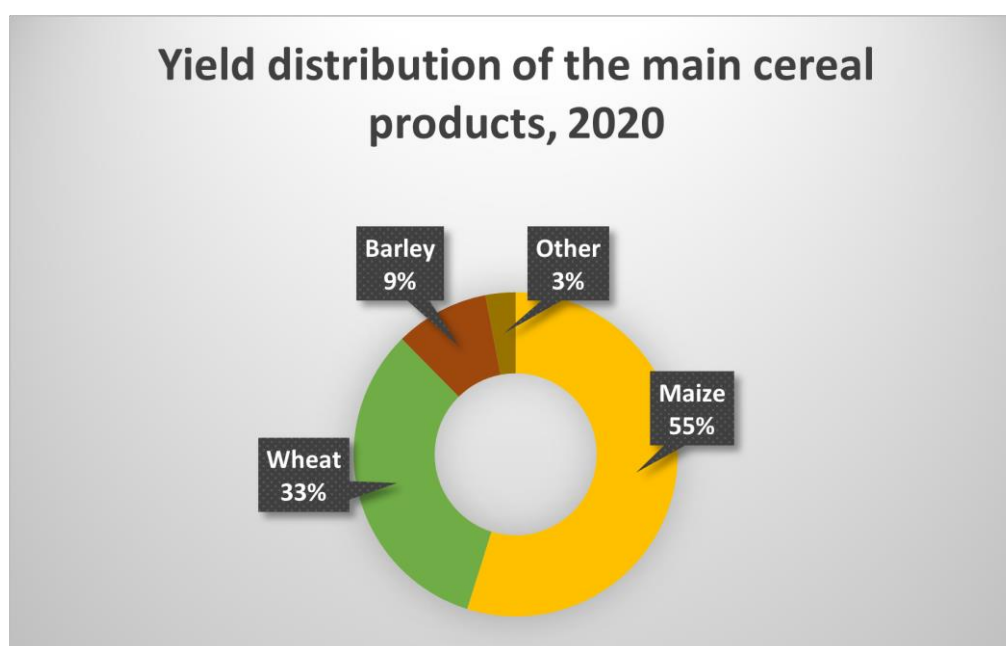


Figure 15. HUNGARY - Yield distribution of the main cereal products, 2020 – Own edit<sup>33</sup>

Table 5: HUNGARY - Main cereal statistics 2019-2020<sup>34</sup>

	Wheat		Maize		Barley		Other		Total	
	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020
Area (acre)	1 015 640	933 000	1 027 592	973 000	247 366	247 366	134 265	146 634	2 458 452	2 300 000
Yield (t)	5 377 707	5 000 000	8 277 813	8 400 000	1 383 260	1 430 000	510 217	447 131	15 698 131	15 277 131
Domestic cons. (t)	2 910 162	-	5 103 950	-	911 173	-	479 736	-	9 526 204	-
Import (t)	115 803	-	204 505	-	22 197	-	63 031	-	412 745	-
Export (t)	2 467 545	-	3 173 863	-	472 087	-	30 481	-	6 171 927	-

## Wheat

The wheat production of 5 million tonnes was 6.8% less than in 2019. This is mainly due to the fact that the area harvested in 2020 was 8.1% smaller, 933 thousand acres. However, the average yield of 5.4 tonnes / acre was an outstanding result: 1.5% higher than the previous year and 1.8% higher than the 2015-2019 average.

<sup>33</sup> Source: [Főbb növénykultúrák terméseredményei, 2020 \(ksh.hu\)](https://www.ksh.hu)

<sup>34</sup> Source: KSH.hu

## Maize

In 2020, the area of harvested maize was 973 thousand acres, thus its cultivation area decreased by 5.3% in one year, but the 8.4 million tonnes of harvested crop were higher by 1.3% than in 2019, and 9.3% higher than in the previous five years. The average yield per acre was 8.6 tonnes, which compared to 2019 was 6.9% higher and 15% higher than the average of the last five years.

## Barley

The yield of barley grown in the third largest area reached the highest yield of 1.43 million tonnes of the last three years, while its share was 9.4%.

## 4.2 Protein crops

Farming practices on a transition path to lead to stable cereal production by 2030

EU protein crops production still on the rise Protein crops include peas and faba beans as well as lentils, chickpeas and other dry pulses. For the past 10 years, the EU area dedicated to these crops has increased. This has been driven by policy incentives, increasing domestic consumption, both through wider inclusion in the feed rations, and increasing popularity for human consumption. Furthermore, these nitrogen fixing crops are used in crop rotation systems. In recent years, adverse conditions at the time of sowing and during crop development limited the expansion of these crops and imports made it possible to meet the continuously growing demand. Between 2020<sup>35</sup> and 2030, the protein crops area is projected to increase by 37% and reach 2.9 million ha. Thanks to a conducive policy environment and market prospects, further inclusion of these crops in the rotation should be favoured. As these crops continue to attract interest, yields are projected to benefit from research and innovation in genetics, as well as in farming practices and increasingly efficient rotation systems. The domestic market is expected to grow by 31% in the upcoming decade to reach 6.7 million t in 2030. This would be a 31% increase compared with 2020 market volumes. Most of the growth should come from a significant increase in human consumption (+3.9% per year), with per capita food consumption possibly reaching 6.7 kg (+50%). This is projected to come from increasing consumption of raw products and from thriving food innovations in the use of plant-based proteins.<sup>36</sup>

Within this context, the analyzed "Assessment of growth potentials for main agricultural products" Country reports (chapter 4.2 Protein crops) was focused on area and yield developments results in total production, dynamics of domestic consumption; covering of the consumption from domestic

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<sup>35</sup> 2020 represents the 2018-2020 average.

<sup>36</sup> EC (2020), EU agricultural outlook for markets, income and environment, 2020-2030. European Commission, DG Agriculture and Rural Development, Brussels

production and / or imports, trade - Intra-Community trade and exports / imports outside EU, also medium-term outlook, based on available data and forecasts.

The main elements identified, by country, are found in the following, while details are found in each of the country reports.

## AUSTRIA

### Area and yield developments

In year 2019, grain legumes (protein plants) were grown on an area of approx. 17.700 ha. In 2020, the cultivation area expanded to 18.754 ha, 6.1% more than in year 2019.<sup>37</sup> Below an overview of the development of the cultivated area between 2015 – 2019 for grain peas (green), broad beans (brown) and other pulses (flat peas, lentils, etc. – orange):

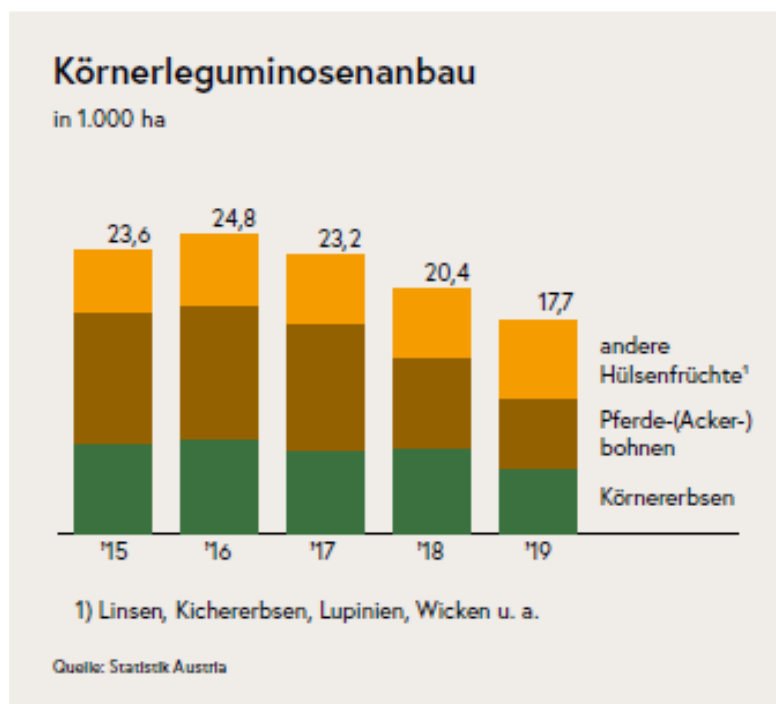


Figure 16: AUSTRIA - Cultivation area of main protein plants 2015 - 2019<sup>38</sup>

Also an overview of the yields obtained in 2019 and 2020 for the main categories of protein crops:

<sup>37</sup> Statistik Austria: [http://www.statistik.at/web\\_en/statistics/Economy/agriculture\\_and\\_forestry/farm\\_structure\\_cultivated\\_area\\_yields/land\\_use/index.html](http://www.statistik.at/web_en/statistics/Economy/agriculture_and_forestry/farm_structure_cultivated_area_yields/land_use/index.html)

<sup>38</sup> Grüner Bericht 2020, Federal Ministry of Agriculture, Regions and Tourism, p. 32

*Table 6: AUSTRIA - Yields of main protein crops 2019 - 2020<sup>39</sup>*

Yields in tons	Yr. 2019	Yr. 2020
Grain peas	12.799	13.097
Broad beans	13.032	14.038
Other pulses (flat peas, lentils, etc)	12.964	15.664

### Dynamics of domestic consumption

Austria reached a level of self-sufficiency with protein plants of 77%. Most of the protein crops are used as raw materials for animal feed production.

*Table 7: AUSTRIA - Supply balance for protein plants 2013 - 2019<sup>40</sup>*

Supply balance for protein plants in Austria 2013/14 until 2018/19 in tons						
Balance sheet item	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
<b>Production</b>	<b>41.391</b>	<b>50.914</b>	<b>54.866</b>	<b>59.642</b>	<b>50.137</b>	<b>45.285</b>
Imports	11.201	9.469	11.567	16.168	18.571	18.731
Exports	2.388	5.637	6.783	7.503	6.324	5.020
<b>Domestic consumption</b>	<b>50.205</b>	<b>54.747</b>	<b>59.650</b>	<b>68.307</b>	<b>62.384</b>	<b>58.997</b>
Animal feed	39.657	43.180	47.413	54.721	49.176	45.651
Seed	3.399	4.009	4.161	3.939	3.531	2.983
Losses	1.242	1.527	1.646	1.789	1.504	1.359
<b>Human consumption</b>	<b>5.907</b>	<b>6.030</b>	<b>6.430</b>	<b>7.858</b>	<b>8.173</b>	<b>9.004</b>
per capita in kg	0,7	0,7	0,7	0,9	0,9	1,0
<b>Level of self-sufficiency in %</b>	<b>82</b>	<b>93</b>	<b>92</b>	<b>87</b>	<b>80</b>	<b>77</b>

Q: STATISTIK AUSTRIA, Versorgungsbilanzen. Erstellt am 30.04.2020.

### Imports and exports

Austria is a net importer of protein plants (see the table above). The imported quantities are growing mainly due to the growth in human consumption.

<sup>39</sup> Statistik Austria:

[https://www.statistik.at/web\\_de/statistiken/wirtschaft/land\\_und\\_forstwirtschaft/agrarstruktur\\_flaechen\\_ertraege/feldfruechte/index.html](https://www.statistik.at/web_de/statistiken/wirtschaft/land_und_forstwirtschaft/agrarstruktur_flaechen_ertraege/feldfruechte/index.html)

<sup>40</sup> Statistik Austria

[https://www.statistik.at/web\\_de/statistiken/wirtschaft/land\\_und\\_forstwirtschaft/preise\\_bilanzen/versorgungsbilanzen/index.html](https://www.statistik.at/web_de/statistiken/wirtschaft/land_und_forstwirtschaft/preise_bilanzen/versorgungsbilanzen/index.html)

## BULGARIA

Significant growth is present in fresh legumes harvested from open areas - by nearly 67%, and slightly pronounced - in vegetables of the genus Brassica (head cabbage, cauliflower and broccoli) - by 0.9%.

The total production of dried legumes (ripe beans, lentils and chickpeas) from open areas in 2019 is 16.9 thousand tonnes - 74% less than in 2018, a decrease is observed in all three main crops.

*Table 8: BULGARIA - Areas, production and average yields of vegetables - harvest 2019<sup>41</sup>*

Crop	Harvested areas (ha)		Production (tonnes)							Average yield from open areas (kg/ha)	
			From open areas		Greenhouse production		TOTAL			2018	2019
	2018	2019	2018	2019	2018	2019	2018	2019	Change 2019/2018		
<b>Fresh leguminous crops, including:</b>	667	1153	3468	5781	5	3	3473	5784	66.5%	-	-
Garden peas green	479	919	1707	4618	-	-	1707	4618	170.5%	3564	5025
Garden beans green	188	234	1761	1163	5	3	1766	1166	-34.0%	9367	4970
<b>Dry leguminous crops, including:</b>	6912	14042	65118	16912	-	-	65118	16912	-74.0%	-	-
Beans	1809	1396	2246	1400	-	-	2246	1400	-37.7%	1242	1003
Lentils	3179	1273	3209	1386	-	-	3209	1386	-56.8%	1009	1089
Chick-peas	59841	11373	58342	14126	-	-	58342	14126	-75.8%	975	1242
Other dried leguminous crops (peas and broad beans)	1083	-	1321	-	-	-	1321	-	-	-	-
<b>Total vegetables and dried leguminous crops</b>	107758	51617	775290	668220	130944	100819	906234	769039	-15.1%	-	-

<sup>41</sup> Source: MAFF, Agrostatics Department, Survey „Vegetables Production”



## CROATIA

In 2019, on an area of 2,437 ha, which was used for the production of dried legumes, a total of 4,750 t of dried legumes were produced with an average yield of 2 t/ha.

The most common dried legumes are **fodder peas and beans**. In 2019, observed in compared to the average of the five-year period from 2014 to 2018, we record a decrease harvest area by 4.4%, increase in production of dried legumes by 19.9% and at the same time higher yield by 25.4%.

In 2019, **beans** make up 29.1% of total dried legume production, while **fodder peas** make up as much as 60.4% of total dried legume production. In 2018, the self-sufficiency of dry legumes is 49.3% and is lower than the previous year, when it was 54.7%. In 2019, the total production of beans for dry grain on an area of 1,113 ha was 1,381 t, with a yield of 1.2 t/ha.

Compared to the average of the five-year period from 2014 to 2018, in 2019 the harvested area under beans for dry grain is lower by 25.5%, the production of the same is lower by 1.7%, while the yield is higher by 27.7%. In 2019, the total production of fodder peas on an area of 1,181 ha amounted to 2,870 t, with a yield of 2.4 t/ha.

Compared to the average of the five-year period from 2014 to 2018, in 2019 harvest areas increased by 26.3%, fodder pea production also increased by 26.8%, while the yield is lower by 0.9%. In 2019, the harvested area under peas for dry grain was 143 ha, and produced is 499 t of peas for dry grain, while the yield was 3.5 t/ha.

Compared to the average of the five-year period from 2014 to 2018, in 2019 harvest areas are higher by 18.8%, production of peas for dry grain is higher by 69.2%, while yield higher by 42.9%.

According to the available data from various aggregators of agriculture related news, data shows that lentils production in Croatia happens over an area of 22 hectares, while the total production was 46 tonnes. Based on the aforementioned data, results indicate a yield of 20.909 hectograms per hectare.

As for the foreign trade calculations, using the available data, import statistics outweighed the export in a 19.72:1 ratio. Import of lentils amounted to 493 tons in 2017, while the export presented itself almost 20 times less than import.

From the period of 1997 all the way towards 2005 yields were in a consolidation phase where the fluctuations were barely recognisable. Sharp decline of 30% followed in 2008 where most of the global markets took a hit. From that period onwards, slow and steady growth is taking place while peaking in 2015.

## REPUBLIC OF MOLDOVA

According to NBS data, in 2019, the Republic of Moldova produced 50.9 thousand tonnes – leguminous crops, including beans - 11.9 thousand tonnes (23.4%). Imports of leguminous crops amounted to 1.2 thousand tonnes, which constitutes approx. 2.2% of the total resources available.

During 2019, protein crops in volume of 54.6 thousand tonnes were used, including: (i) export 27.1 thousand tonnes (49.6%), of which beans – 2 thousand tonnes (7.4%), (ii) feed – 7.5 thousand tonnes

(13.7%), (iii) personal consumption of the population 13.4 thousand tonnes (24.5%), of which beans – 6.6 thousand tonnes (49.2%).

*Table 9: REPUBLIC OF MOLDOVA - Balance of leguminous crops, thousand tonnes, 2019<sup>42</sup>*

Product name	Resources, thousand tonnes				Usage, thousand tonnes							Level of self sufficiency supply, %
	Product	Import	Stock variation	Total resources	Export	Seeds	Fodder	Processing for non-food purposes	losses	Personal Consumption of population	Total usage	
<b>Leguminous crops</b>	<b>50.9</b>	<b>1.2</b>	<b>2.5</b>	<b>54.6</b>	<b>27.1</b>	<b>5.0</b>	<b>7.5</b>	-	<b>1.8</b>	<b>13.4</b>	<b>54.6</b>	<b>184.8</b>
beans	11.9	0.1	-2.3	9.7	2.0	0.9	0.0	-	0.1	6.6	9.7	155.0
Other leguminous crops	39.0	1.1	4.8	44.9	25.0	4.0	7.5	-	1.6	6.7	44.9	196.3

The analysis of the information on leguminous crops for grains in the years 2012 to 2019 shows that the largest: (i) the seeded area was reported in 2019 – 40 thousand ha, (ii) cultivated production and average harvest obtained was in 2017 – 69 thousand tonnes and 20 quintals/ha respectively.

The analysis of the information shows that the production of beans has remained constant. The largest harvest was registered in 2014 – 16 thousand tonnes, the lowest in 2012 – 5 thousand tonnes, and 12 thousand tonnes were harvested in the last two years. During 2012-2019, the volume of personal consumption of population of beans was variable. The lowest consumption was reported in 2013 (5) and the highest in 2014 (14). In 2019 8 thousand tonnes of beans were consumed, representing a decrease of 3 thousand tonnes compared to 2018 (11).

Depending on the fluctuation in demand and price on the regional market, it is forecast that by 2030 the area sown with leguminous crops for grains will remain around 40 thousand ha and global production will increase to 65 thousand tonnes, taking into account that the average harvest will range from 1.1 to 2.1 t/ha.

## REPUBLIC OF SERBIA

### Peas

Table below shows harvested area, total production and yield per hectares peas. The area planted with peas in Serbia has decreased last few years, from 8,097 hectares in 2017 to 6,038 tonnes in 2020.

<sup>42</sup> Source: NBM (2021)

*Table 10: REPUBLIC OF SERBIA - Peas: Area harvested, production and yield per year<sup>43</sup>*

<b>Peas</b>			
Years	Area harvested, ha	Production, t	Yield ha/t
2017	8,097	37,854	4.7
2018	6,736	29,261	4.3
2019	6,282	25,612	4.1
2020	6,038	27,612	4.6

## Beans

Table below shows harvested area, total production and yield per hectares of beans. The area planted with beans in Serbia has decreased last few years, from 13,181 hectares in 2017 to 8,512 thousand in 2020. Yield per hectares beans is constantly about 1 ha/t.

*Table 11: REPUBLIC OF SERBIA - Beans: Area harvested, production and yield per year<sup>22</sup>*

<b>Beans</b>			
Years	Area harvested, ha	Production, t	Yield ha/t
2017	13,181	13,034	1,0
2018	9,112	11,140	1,2
2019	9,091	9,027	1,0
2020	8,512	9,253	1,1

## Lucerne

Table below shows harvested area, total production and yield per hectares of Lucerne. The production of Lucerne in Serbia has growth last few years, from 475,580 tones in 2017 to 650,360 tones in 2020. Yield per hectares drastically increased from 4.2 ha/t in 2017 to 6.2 ha/t in 2020.

<sup>43</sup> Statistical Office of the Republic of Serbia, [www.stat.gov.rs](http://www.stat.gov.rs)

*Table 12: REPUBLIC OF SERBIA - Lucerne: Area harvested, production and yield per year<sup>44</sup>*

<b>Lucerne</b>			
Years	Area harvested, ha	Production, t	Yield ha/t
2017	112,218	475,580	4.2
2018	103,366	513,316	5.0
2019	106,095	594,981	5.6
2020	104,191	650,360	6.2

## **SLOVAKIA**

After four years (2014-2017) of increasing the growing areas of pulses for grain<sup>45</sup>, their area in 2018 and 2019 decreased year-on-year. In 2019, grain legumes were sown on an area of 9,769.11 ha, which meant a year-on-year decrease in areas by 14.6% to 9.8 thousand. ha. The share of legumes in the grain area decreased year-on-year from 1.5% in 2018 to 1.3% in 2019. The share of legumes in the total area sown by field crops decreased from 0.9% in 2018 to 0.7% in 2019. The most widespread cultivated legume in Slovakia is peas, whose share in 2019 in the sown area of pulses for grain reached 71.1%. The share of sown lupine reached 10.1%, the share of crayfish 6.1%, vetch sown 2.0%. The pulse mixture accounted for 3.4% and the beans for 3.4%. Edible beans accounted for 1.6% and lentils for 1.3%.

Grain legumes were harvested from an area of 9,308 ha, which meant a year-on-year decrease of 13.9%. However, due to increased production from 1 ha by 16.5% to 2.21 tons, the achieved yield increased by 0.2% to 20,550.7 tons.

Sows of peas (edible and fodder peas) accounted for 81.7%, beans for 0.4% and lentils for 0.7%. The increase in production was reflected in the volume of total supply for domestic use and exports, which increased slightly by 0.9% year-on-year to 41,943 tons. Total use, resp. demand for pulses increased as a result of an increase in exports and food consumption by 5.5% to 29,401 tons.

In the 2019-20 marketing year, the trade in grain legumes reached a negative foreign trade balance in financial terms in the amount of 2,218.6 thousand. €, which was 1,001.0 tons. This meant a year-on-year decrease of 15.9% in financial terms and 52.5% in tons. The better balance was due to a 7.3% year-on-year increase in sown exports, i.e. j. about 263.2 tons.

<sup>44</sup> Statistical Office of the Republic of Serbia, [www.stat.gov.rs](http://www.stat.gov.rs)

<sup>45</sup> Situation and outlook report - Legumes , National Agricultural and Food Centre, Research Institute of Agricultural and Food Economics, ISBN 978-80-8058-568-6, 10/2020

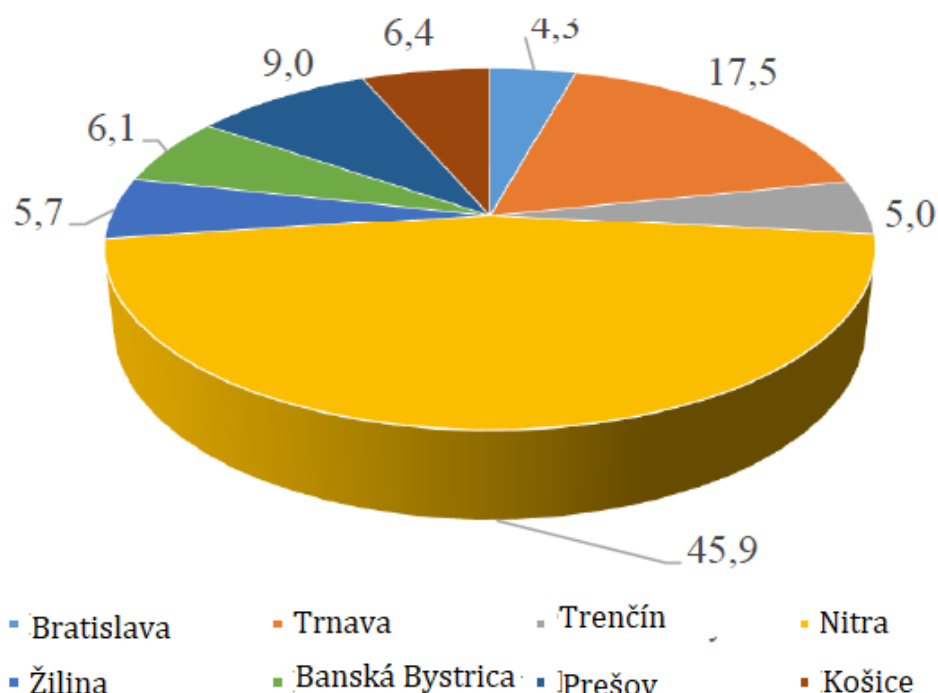


Figure 17: SLOVAKIA - Regional production of protein crops, 2018

Table 13: SLOVAKIA - Production of protein crops, 2015-2019

Crop	Parameter / Year	2019	2018	2017	2016	2015
Peas	Harvest area	4 154	3 112	3 789	3 294	3 107
	Harvest (t)	16 793	6 697	9 398	9 787	10 712
	Harvest per ha (t)	4,04	2,15	2,48	2,97	3,45
Beans	Harvest area	99	91	90	71	60
	Harvest (t)	74	127	73	108	79
	Harvest per ha (t)	0,74	1,38	0,82	1,52	1,31
Lentils	Harvest area	124	372	509	522	400
	Harvest (t)	141	278	597	327	450
	Harvest per ha (t)	1,14	0,75	1,17	0,63	1,12

## Peas

As of 20 May 2019, the Statistical Office of the Slovak Republic registered the area of peas sown on an area of 6,946 ha, which meant a decrease in its growing areas by 13.8% year-on-year and the share of peas in legumes totaled 71.1% (an increase of 0.6 pp). Peas have traditionally been sown mainly in the Nitra region (44.1%). The area of edible peas decreased by 2.7% year-on-year to 2,770.85 ha and feed peas by 19.9% to 4,175.27 ha.

In the 2019-20 marketing year, the harvested area of peas decreased by 16.6% compared to the previous year to 6,700 ha (by 1,338.0 ha). As a result of the increase in yield from 1 ha by 21.3% to 2.51 tons compared to the previous year, production increased by 1.1% (by 176.0 t) to 16,793 tons.

The total supply of peas, which decreased by 0.04% on the domestic agri-food market, was affected by the level of opening stocks, which was 2.8% lower than in the previous year, and imports, which increased by 17.9%.

According to available data, as of 30 June 2020, 6.0% more peas were consumed in Slovakia than in the previous year, i. j. 15,054 tons. The increase in consumption was mainly due to food consumption.

The increase in domestic consumption of peas was reflected in final stocks, which are estimated at 30,871 tons as of 30 June 2020, a decrease of 9.4% compared to the previous year. Slovakia's self-sufficiency in peas, measured by the share of production in consumption, is estimated for the evaluated marketing year by an index of 111.6%, which means a year-on-year decrease of 5.5 percentage points.

As of 20 May 2020, the Statistical Office of the Slovak Republic registered the area of peas sown on an area of 9,658 ha, which meant an increase in its growing areas by 39.0% year-on-year and the share of peas in grain legumes totaled 81.0% (an increase of 10.9 pp). Peas have traditionally been sown mainly in the Nitra region (42.2%). The area of edible peas increased year-on-year by 43.9% to 3,986.02 ha and feed peas by 35.9% to 5,672.17 ha. As of 15 August 2020, the Statistical Office of the Slovak Republic estimated the pea yield from 1 ha to 2.65 t / ha, which would mean an increase in the estimated pea yield in 2020 to 25.6 thousand Tons.

## **Bean**

In the 2019-20 marketing year, beans were sown on an area higher than in the previous year by 59.8% to 151.7 ha. The beans were harvested from an area of 99.4 ha, which meant an increase of 8.7% compared to the previous year. The yield of beans from 1 ha decreased by 46.4% year-on-year to 0.74 tons, which subsequently affected the total production, which decreased by 41.5% to 74.0 tons. Available data show that the largest harvested areas were registered as in the previous year in the Trnava and Košice regions, but the largest yield of 1 ha was achieved in the Trenčín region 2.06 t / ha. The total supply of beans on the agri-food market for domestic consumption and exports increased by 4.7% to 3,271.2 tons due to increased imports by 10.1%. Based on available data on the market situation, the demand for beans increased year-on-year, as bean exports increased by 50.0%. The coverage of bean consumption by domestic production decreased year-on-year in 2019-20 by 2.0 pp. b. at 4.0%.

In the current marketing year 2020-21, the beans were sown on an area of 65.9 ha, lower than in the previous year by 56.5%. Most in the Bratislava and Banská Bystrica regions. It is assumed that the production of beans at the estimated average yield per hectare 0.82 t / ha will reach a maximum of 54.0 tons, which would mean the historically lowest bean production in Slovakia and self-sufficiency at the level of 2.5%.

## **Lentil**

For the harvest of lentils in 2019, lentils were sown on an area of 123.5 ha, t. j. on an area lower by 69.9%. Lentils were sown only in the Trnava, Nitra and Banská Bystrica regions. The harvest was harvested from the same acreage, lower by 66.8% than in the previous year. The production of lentils decreased by 49.4% to 140.5 tons, which was mainly due to a decrease in growing areas. The yield from 1 ha increased by 52.0% year-on-year to 1.14 tons. However, the total supply of lentils on the domestic agri-food market, due to higher year-on-year initial stocks and higher imports, reached a volume higher than in the previous year by 5.1%, t. j. 3 577 tons. Domestic production covered domestic consumption to 7.0% (a decrease of 7.1 pp). For the lentil harvest in 2020, the lentils were



sown on an area of 263.7 ha, t. j. higher by 113.5%. It was sown in the Trnava, Nitra and Košice regions. Due to the favorable weather this year, it is possible to estimate the harvest of lentils from 1 ha to 1.02 t and the production of 269.0 tons, 91.5% higher than in the previous year. At the same time, it is possible to estimate an increase in self-sufficiency in lentils to 12.2% (an increase of 6.7 pp), which presupposes, given the development of consumption on the Slovak market so far, the import of lentils at least in the volume of 2,700 tons.

## HUNGARY

The importance of protein crops has been steadily declining since 2015. In 2019 it reached only 79% of the average of the last ten years (17.5 thousand acres). Both the amount of fodder and edible dry peas have decreased, totaling about a thousand acres. Other than peas and beans there is no other significant protein crops production in Hungary.

*Table 14: HUNGARY - Main protein crops statistics 2018-2019<sup>46</sup>*

	Beans		Peas		Total	
	2018	2019	2018	2019	2018	2019
Area (acre)	739	641	15 507	15 222	16 246	15 863
Yield (t)	1 647	1 415	31 404	37 979	33 051	39 394
Domestic cons. (t)	1 990	2 048	51 522	53 793	53 512	55 841
Import (t)	11 632	12 153	4 307	4 924	15 939	17 077
Export (t)	3 902	2 733	18 868	18 146	22 770	20 879

<sup>46</sup> Source: [www.ksh.hu](http://www.ksh.hu)

## 4.3 Oilseeds

### Stagnating EU oilseed production by 2030

The EU oilseed area is projected to slightly decline in the 2020<sup>47</sup>-2030 period, driven by a continuous downward trend in rapeseed, bringing the total oilseed area to 10.7 million ha.

The rapeseed area is expected to go down at a slower rate than in the previous decade, the projection being that it should reach 5.3 million ha in 2030 (-4% compared with 2020). In the period 2010-2020, the EU rapeseed area declined by 7%, with a rebound in 2015. However, this decline will be limited thanks to the usefulness of rape in crop rotation systems and good market prospects for rape meals and rape oil demand (see section on Oilmeals and Vegetable Oils). Nevertheless, plant health challenges encountered in recent years will not fade and uncertainties remain as to rapidly evolving climatic conditions and extreme events that hamper sowing and/or plant development. The ongoing evolution of the authorised phyto-sanitary products currently in use is also pushing operators to find alternative solutions that should make it possible to return to yield growth in the medium term.

Sunflower seed and soya bean areas are projected to continue expanding by 2030. Compared with 2020, the sunflower area should only slightly increase, by around 1%. In contrast, the soya bean area is expected to increase by 13.5% over the outlook period. It should benefit from an increasing use in the crop rotation system as an alternative to rapeseed and/or sugar beet. At the same time, it offers agro-environmental benefits. Moreover, a conducive policy environment and positive market prospects in the growing sectors of meat and dairy alternatives and domestic feed should boost soya production across the EU.

Total EU oilseed production should total 30.2 million t in 2030. Thanks to the positive yield development, particularly for soya beans, production should increase from the low levels in 2018-2020. Rapeseed, sunflower and soya bean production could reach, respectively, 16 million t (-2.2% compared with 2020), 10.6 million t (+6.6%) and 3.5 million t (+26.9%) in 2030.

### EU soya bean trade projected to stabilise

While EU oilseed trade is expected to slow down in the medium term, soya bean imports should stabilise to meet the demand for animal feed and, while soya meal imports should decline. According to the latest estimates from the OECD-FAO Outlook 2020-2029, global soya production will increase by 15.6% by 2029. With only a few countries highly specialized in soya production, global trade is expected to grow to meet the world feed demand.<sup>48</sup>

Within this context, the analyzed "Assessment of growth potentials for main agricultural products" Country reports (chapter 4.3 Oilseeds) was focused on area and yield developments results in total production, dynamics of domestic consumption; covering of the consumption from domestic

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<sup>47</sup> 2010 and 2020 represents the 2008-2010 and 2018-2020 averages

<sup>48</sup> EC (2020), EU agricultural outlook for markets, income and environment, 2020-2030. European Commission, DG Agriculture and Rural Development, Brussels

production and / or imports, trade - Intra-Community trade and exports / imports outside EU, also medium-term outlook, based on available data and forecasts.

The main elements identified, by country, are found in the following, while details are found in each of the country reports.

## **AUSTRIA**

### **Area and yield developments**

In year 2018/19, Austria produced 386.900 tons of oilseeds. In 2020, an increase of 4,8% to 166.148 ha was observed for oil seed crops.<sup>49</sup>

In year 2020, the total production of oilseeds and grain legumes was of 432.000 tons (-4% compared to 2019). The yields of soybeans were above average, even though the total yield decreased by 6% compared to 2019 and reached 202.500 tons.<sup>50</sup>

The areas cultivated with rape and colza decreased by 12% compared to 2019. Together with average yields, this resulted into a production low of 103.000 tons.

The crops cultivated with soybeans slightly decreased by 1% and the production was of 202.500 tons (-6% compared to 2019). However, the yields were below-average.

The crops with sunflower seeds also generated below-average yields with a final production of 56,200 tons (-12% compared to 2019), despite an increase of the cultivated area of 11%.

The areas cultivated with oil pumpkin were massively extended in 2020 by +41%, especially in Lower Austria and Styria. For the first time, the areas cultivated with oil pumpkin were larger than the ones cultivated with rape. The yields of oil pumpkin amounted 23.000 tons.

### **Imports and exports**

In year 2019, Austria imported oilseeds mainly from Hungary. The main import categories were rape and colza seeds (303.500 tons), sunflower seeds (157.900 tons) and soybeans (146.200 tons).<sup>51</sup>

In year 2019, Austria exported mainly sunflower seeds (73.400 tons), soybeans (67.800 tons) and rape and colza seeds (73.200 tons).

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<sup>49</sup> Statistik Austria:

[http://www.statistik.at/web\\_en/statistics/Economy/agriculture\\_and\\_forestry/farm\\_structure\\_cultivated\\_area\\_yields/land\\_use/index.html](http://www.statistik.at/web_en/statistics/Economy/agriculture_and_forestry/farm_structure_cultivated_area_yields/land_use/index.html)

<sup>50</sup> Statistik Austria

[https://www.statistik.at/web\\_de/statistiken/wirtschaft/land\\_und\\_forstwirtschaft/agrarstruktur\\_flaechen\\_ertraege/feldfruechte/index.html](https://www.statistik.at/web_de/statistiken/wirtschaft/land_und_forstwirtschaft/agrarstruktur_flaechen_ertraege/feldfruechte/index.html)

<sup>51</sup>: Grüner Bericht 2020, Federal Ministry of Agriculture, Regions and Tourism, p. 33

## BULGARIA

The main oilseed crops traditionally grown in Bulgaria are sunflower and winter rapeseed.

*Table 15: BULGARIA - Production of oilseeds from harvest `2018 and` 2019<sup>52</sup>*

Crop	Harvested areas			Average yield (tonnes/ha)			Production (tonnes)		
	2018	2019	Change 2019/2018	2018	2019	Change 2019/2018	2018	2019	Change 2019/2018
Sunflower	788 656	815 561	3,4%	2,44	2,35	-3,9%	1 927 040	1 914 072	-0,7%
Rapeseed	182 619	151 174	-17,2%	2,58	2,83	9,8%	471 035	428 256	-9,1%

### Rapeseed

Rapeseed production from the harvest `2019 amounted to 428.3 thousand tonnes. The quantity was 1.9% below the level of 2018.

The areas planted with rapeseed in 2019 were 152,800 ha, of which 151,174 ha have been harvested - a decrease of 17.2% on an annual basis. On the other hand, the average yield increased by 9.8%.

### Soya beans

Bulgaria has excellent soil and climate conditions for soya beans cultivation, and the country was the world's number one producer of soya beans.

In the years after the accession to the EU, the registered yield in Bulgaria is symbolic and is limited to only 6000-8000 tons per year, with sown about 10,000 acres of crops throughout the country. In 2015, the soybean areas in Bulgaria reached 35 000 ha.

At the beginning of the new programming period of the Common Agricultural Policy due to the "Green payments" for soybeans and the support for protein crops set in the Rural Development Program (RDP) 2014-2020, many Bulgarian farmers made their first attempts to grow Bulgarian soya bean until 2017 when the soybean yields were very low.

The shortage of soya beans requires imports from other countries like Brazil, Moldova and Ukraine. Bulgaria imports soy mainly from the northern parts of Brazil, where it is assumed that fewer crops are GMOs, over 80 percent of the raw material that comes from the American continent is genetically modified.

According to the director of the Soy Experimental Station in Pavlikeni, every year Bulgaria imports 50-60 thousand tons of soya bean meal worth about 20-25 million dollars. If the productivity in the

<sup>52</sup> Source: MAFF, Agrostistics Department

country increases, at yields of 1 million / dca Bulgaria will have the potential to export to neighboring countries.

## CROATIA

### Soybeans

Area	<b>78,330</b> Ha in 2019
Production	<b>244,280</b> tonnes in 2019
Yield	<b>31,186</b> Hg/Ha in 2019

*Figure 18 CROATIA - Agriculture Indicators: Soybeans*

Harvest area for soybeans in 2019 was 78,334 ha, yield per hectare was 3.1 t, and the total production was 244,279 t. Yield per hectare in 2019 was reduced by 3.1% compared to 2018. Total soybean production in 2019 decreased by 0.4% in relation to total production in 2018.

In the period from 2014 to 2018, an average of 204,977 t was produced annually soybeans and thus production in 2019 is higher by 19.2% compared to the five-year average.

Exports	<b>214,813</b>
Imports	<b>13,606</b>

*Figure 19 CROATIA - Foreign Trade: Soybeans (tonnes in 2019)*

In the period from 2014 to 2018, on average, soybeans were produced on an annual basis area of 75,361 ha and the areas in 2019 are higher by 3.9% compared to the five-year average, and the yield per hectare in 2019 is higher by 14.0%.

The importance of soybeans as grain legumes is primarily in the production of meal and then oil.

We have a surplus through foreign trade in soybeans. In 2019, 214,813 t were exported of soybeans worth 72.4 million euros, while 13,606 t of soybeans worth 5.9 were imported million. Higher exports than imports resulted in a surplus of EUR 66.5 million.

### Oilseed rape (rapeseed)

Harvest area for oilseed rape in 2019 was 41,361 ha, yield per hectare 2.5 t, while total production was 103,900 t. Rapeseed yield per hectare in 2019 it is lower by 10.7% than the yield achieved in 2018. Harvesting areas of oilseed rape in 2019, they decreased by 24.8% compared to 2018, and total oil production rapeseed in 2019 decreased by 33.3%.

In the observed five-year period, foreign trade in oilseed rapes a surplus was achieved. In 2019, 88,112 t of oilseed rape worth 32.2 million euros were exported, while 11,259 t of rapeseed worth 6.2 million euros were imported and realized a surplus of 26 million euros.

In the period from 2014 to 2018, on average, oilseed rape was produced on an area of 37,105 ha and these areas in 2019 are higher by 11.5% compared to the five-year average, a yield per hectare in 2019 is lower by 12.9%. In addition to its importance in livestock nutrition and oil production, oilseed rape is also important for production of biodiesel.

### Sunflower

In 2019, 35,982 ha of sunflowers were harvested, on which 106,555 t were produced sunflower seeds with an average yield per hectare of 3 t. The yield of sunflower per hectare in 2019 is the same compared to the yield in 2018. Harvested sunflower areas in 2019 decreased by 3.1% compared to 2018, and the total sunflower production in 2019 decreased by 3.8%. In the period from 2014 to 2018, an average of 106,160 t of sunflower was produced annually and thus production in 2019 is higher by 0.4% compared to five years average.

In the period from 2014 to 2018, sunflower was produced on average annually on an area of 36,779 ha and those areas in 2019 are lower by 2.2% compared to five-year average, and the yield per hectare is higher by 3.9%. Except for the production of edible oil, a by-product of sunflower processing (sunflower cake) used as quality fodder for fattening of the cattle. In the five-year period from 2014 to 2018, no significant imports of sunflowers were recorded and an exchange surplus was achieved. In 2019, 73,872 tons of sunflowers were exported in value of EUR 24.2 million, while 2,862 t of sunflowers worth EUR 3 million were imported and realized a surplus of 21.2 million euros.

## REPUBLIC OF MOLDOVA

Information on areas sown with sunflower, soybeans and rapeseeds, production and average harvest for the years 2012 to 2019 is given below.

*Table 16: REPUBLIC OF MOLDOVA - Areas sown with sunflower, production and average harvest, 2012 – 2019<sup>53</sup>*

Type of crops	2012	2013	2014	2015	2016	2017	2018	2019
<b>Sunflower</b>								
Area sown, thousand ha	299	298	320	330	362	385	364	359
Production, thousand tonnes	296	505	548	485	677	804	789	811

<sup>53</sup> Source: NBM (2021)



Type of crops	2012	2013	2014	2015	2016	2017	2018	2019
Average harvest, quintals/ha	10	18	18	15	19	21	22	23
<b>Soybeans</b>								
area sown, thousand ha	60	42	55	68	40	34	28	38
Production, thousand tonnes	48	66	109	48	42	47	58	64
Average harvest, quintals /ha	9	17	21	17	12	14	21	17
<b>Rapeseeds</b>								
area sown, thousand ha	6	26	29	9	18	29	43	38
Production, thousand tonnes	6	43	68	16	43	71	86	77
Average harvest, quintals /ha	10	17	23	19	24	25	20	20

In 2019, the area sown with soybeans was 38 thousand ha, representing an increase of 10 thousand ha compared to 2018 (28) and a decrease of 22 thousand ha compared to 2012 (60). In 2015 the largest area sown - 68 thousand ha - was registered. Soybean production was 64 thousand tonnes in 2019, which means an increase of 8 thousand tonnes compared to 2018 (58) and 16 thousand tonnes respectively compared to 2012 (48). And in 2014 109 thousand tonnes were harvested, which is the largest production during the analysed period.

In 2019, the area sown with the grain rape was 38 thousand ha, representing a decrease of 5 thousand ha compared to 2018 (43) and an increase of more than 6 times compared to 2012 (6). Thus, 77 thousand tonnes were harvested in 2019, which signifies a decrease of 9 thousand tonnes compared to 2018 (86) and an increase of 12.8 times compared to 2012 (6).

According to NBS data, sunflower production increased steadily between 2012 and 2019. Thus, 811,000 tonnes were harvested in 2019, which is an increase of 22 thousand tonnes compared to 2018 (789) and an increase of 2.7 times compared to 2012 (296).

During the reference period, the tendency in export volumes increased. In 2019, 578 thousand tonnes were exported, an increase of 52 thousand tonnes compared to 2018 (526) and an increase of more than 5 times compared to 2012 (113).

In the period 2012-2019, the volume of sunflower processed varied. Thus, in 2019 301 thousand tonnes were processed, representing an increase of 19 thousand tonnes compared to 2018 (282) and an increase of 1.6 times compared to 2012 (193). The lowest volume processed was registered in 2013 (139).

During 2019, 900 thousand tonnes of sunflower seeds were used, including: (a) export 578 thousand tonnes (64.2%), (b) fodder processing – 301 thousand tonnes (33.4%) and (c) feed 5 thousand tonnes (0.5%).

In 2019 agricultural enterprises produced the main part of the volume of sunflowers – 70.1% and soybeans – 61.5%. At the same time, 2.9% of sunflowers were produced by households and 38.4% of soybeans by peasant (farmers) households according to the structure of the global harvest.

In terms of demand and price on the regional market, it is forecast that by 2030 it will increase:

- the area sown with sunflower up to 370 thousand ha and global production will reach about 900 thousand tonnes;
- the area sown with soybeans up to 50 thousand ha and global production will reach about 75 thousand tonnes;
- the area sown with rapeseed for grains up to 40 thousand ha and global production will reach about 80 thousand tonnes.

## **REPUBLIC OF SERBIA**

The area planted with soybeans in Serbia has increased drastically over the last fifteen years, from 131 thousand hectares in 2005 to 230 thousand in 2019.<sup>54</sup> There is a tendency of more and more land area being dedicated to soybean cultivation which is driven by various factors, but the main reasons are increased market demand and good prices. Although yields are still much dependent on weather conditions, improving farmers' knowledge about farm management and introducing digitalization as well as the use of precision agriculture on a larger scale, can further contribute to higher production yields. Knowledge exchange could contribute to improving the performance of individual farmers in the production of protein crops, as well as the development of more productive and resilient varieties could strengthen the domestic soybean sector.

Due to excellent weather conditions in 2018, Serbia had a record high soybean production season. According to the official data from Statistical Office of Serbia, in 2018 Serbia had an average yield of 3.3 metric tonnes per hectare (For comparison, the usual mean is 2.6 t/ha). The total production of soybeans in 2018 reached the capacity of approximately 760,000 tonnes a figure 50% higher than the 2017 number, when production was significantly damaged due to the extreme drought. According to official statistics, the 2019 season was also good with a total production of 710,000 tonnes. Other information sources, like the Commodity Exchange from Novi Sad and Donau Soja Organization in Serbia, have published data which even exceed official statistics on production.

Over the last fifteen years, the total land area covered by soybean plantations in Serbia increased by a hundred thousand hectares, due to high prices on the market and an increasing demand.

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<sup>54</sup>Statistical Office of the Republic of Serbia, [www.stat.gov.rs](http://www.stat.gov.rs)

The main export markets of Serbian soybean are the EU countries and the Russian Federation. Serbian exporters can secure a premium for their commodity and are quite competitive on the international market due to the fact that Serbia is a GMO-free country.

Besides the export markets, there is also a substantial local market for soybean producers: processors and oil mills, animal feed processors, integrators such as livestock and poultry farmers and processors of the soy products for human consumption and soybean added value products.

### Rapeseed

Table below shows harvested area, total production and yield per hectares of rapeseed.

*Table 17. REPUBLIC OF SERBIA - Rape seed: Area harvested, production and yield per year*

<b>Rapeseed</b>			
Years	Area harvested, ha	Production, t	Yield ha/t
2017	19,376	48,740	2.5
2018	45,628	135,422	3.0
2019	30,804	84,311	2.7
2020	24,638	73,668	3.0

### Sunflower

Table below shows harvested area, total production and yield per hectares of sunflower.

*Table 18: REPUBLIC OF SERBIA - Sunflower: Area harvested, production and yield per year*

<b>Sunflower</b>			
Years	Area harvested, ha	Production, t	Yield ha/t
2017	219,338	540,590	2.5
2018	239,148	733,706	3.1
2019	219,404	729,079	3.3
2020	221,149	636,688	2.9

## **SLOVAKIA**

The supply of oilseeds<sup>55</sup> in the 2019/20 marketing year was lower by 158,713 tons compared to the previous marketing year. This was mainly due to a reduction in the production of the main oilseeds, rapeseed and sunflower as well as a significant reduction in imports of oilseeds. Domestic production of oilseeds accounted for 94.1% of the total supply. Due to the persistent absence of domestic oilseed processors, more than half of the supply volume (57.8%) was exported and the other 42.2% was processed at home.

A comparison of the results of oilseed cultivation in the 2019/20 marketing year with the average of the cultivation results in the 2014/15 to 2018/19 marketing years shows that there has been a slight decrease in balance sheet indicators. There was a significant decrease only in imports of oilseeds.

According to the inventory of sown areas of the Statistical Office of the Slovak Republic as of 20 May 2020 for the 2020/21 marketing year, oilseeds were sown on an area of 269,463 ha, which is 9,662 ha (+ 3.7%) more than in the previous marketing year. Of the total area eligible for sowing, soil sown with oilseeds accounts for 20.0% (0.7 pp more than in 2019/20). With an average yield of 2.65 t / ha per hectare, the total production of oilseeds should reach 713,000 t, which will be 94.7% of the total supply. Of the total supply of oilseeds, 69.1% are exported and the rest is processed at home.

### **Sunflower**

The available data of the Statistical Office of the Slovak Republic show that the highest area of the harvested area was sunflower in 2019 in the Nitra Region, namely 48.0% of the total harvested area. With the highest hectare yield of all regions, 50.8% of the total sunflower production was achieved in this region. The largest share in the sowing of sunflowers in 2019 belonged to growers who grew sunflowers for 10 to 15% of their total sown area. Together they occupied 23.6% of the area sown with sunflowers.

After a previous several-year decline in the price of sunflower, in 2019 the price of sunflower increased by 22.57 € / t. In the 2019/20 marketing year, we imported 3,145 t more sunflower to Slovakia than in the previous marketing year. Sunflower exports recorded a significant decrease, by 63,029 t. In foreign trade in sunflowers, our main partner is the Czech Republic. We imported 59.6% of all sunflower imports from there and exported 39.3% of sunflower exports.

In the 2019/20 marketing year, sunflower production decreased significantly by 62,376 tons. This production was the lowest since 2002, when sunflower production reached a volume of 116,876 t. The harvested area of sunflower was the lowest since 1997, when it had an area of 46,994 ha. Due to the low production, the total supply of sunflower in the marketing year 2019/20 was low, compared to the marketing year 2018/19 it was lower by 70,203 t. Almost the entire volume of sunflower use went to export, only 2.0% of the supply was consumed at home.

### **Soybeans**

In the Slovak Republic, the Košice region significantly dominates soybean cultivation. In 2019, it had the largest acreage of soybean harvest, accounting for 50.2% of the total soybean harvest in Slovakia.

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<sup>55</sup> Situation and outlook report - Oilseeds , National Agricultural and Food Centre,  
Research Institute of Agricultural and Food Economics, ISSN 1339-0023, 10/2020

An average hectare yield of 2.63 t / ha was achieved in this region, ie the highest in the Slovak Republic. 53.9% of the total soybean production was produced here.

Imports of soybeans increased significantly year-on-year in the 2019/20 marketing year, increasing by 4,162 t. Soybeans were imported to Slovakia mainly from Austria (36.0%) and Hungary (17.7%).

Exports of soybeans increased significantly, by 36,499 t. It was implemented mainly in Hungary (23.2%), Poland (21.1%), the Czech Republic (18.3%), Austria (18.0%) and Germany (16.0%).

According to the estimate of the Statistical Office of the Slovak Republic as of 15 August 2020, the sown areas of soybeans in 2020 increased by 3,957 ha to 51,890 ha. Production is estimated at 133,046 t, which will be 12,414 t more than last year.

## HUNGARY

In 2019, among the oilseeds, both the harvested area of sunflower and rapeseed decreased; the former by 8.1% and the latter by 8.8%. The amount of sunflower (1.7 million tonnes) was 7.0% less. Rapeseed yields decreased by 11%, 900 thousand tonnes were harvested. Exports of fodder and oilseeds also increased in excess of imports.

*Table 19: HUNGARY - Main oilseeds statistics 2018-2019<sup>56</sup>*

	Soya beans		Rapeseed		Other		Total	
	2018	2019	2018	2019	2018	2019	2018	2019
Area (acre)	62 118	58 227	330 561	300 601	618 078	565 182	1 010 757	924 010
Yield (t)	181 240	169 565	1 002 714	912 116	1 831 684	1 708 335	3 015 638	2 790 016
Domestic cons. (t)	14 106	15 812	-	-	516 484	559 079	530 590	574 891
Import (t)	155 335	148 947	86 578	68 724	154 227	171 777	396 140	389 448
Export (t)	51 400	89 865	707 303	885 335	459 982	481 235	1 218 685	1 456 435

<sup>56</sup> Source: [www.ksh.hu](http://www.ksh.hu)

## 4.4 Sugar beet

### Slow increase in yields due to limit production growth

In the last 3 years, EU sugar beet producers have witnessed adverse weather conditions, while having to adapt to growing limitations on the use of certain plant health substances. These challenges are likely to persist in the near term, but are expected to be overcome in the longer run. Yields could grow from 72 t/ha in the last 3 years (average 2018-2020) to 75 t/ha by 2030.

Higher yields, coupled with a small increase in sugar prices, should improve the economics of the sector and help stabilise the sugar beet area at above 1.4 million ha for the majority of the outlook period. Stable area and slow growth of yields are expected to result in a small increase in EU sugar production, which is projected to reach 16.2 million t in 2030.

Low sugar prices and competition from non-caloric sweeteners as sugar substitutes are expected to limit EU isoglucose production. As a result, production is due to increase modestly to 0.8 million t in 2030.

### The EU on the path to self-sufficiency in sugar

With limited sugar availability in the near term, the EU remains a net importer with stable imports and exports. In the medium term, sugar production is expected to pick up and consumption is expected to continue to decline. This in turn would lead to an increase in exports and a decrease in imports, making the EU self-sufficient and potentially a net exporter of sugar.

EU sugar prices have been well aligned with world prices in the last few years, maintaining a premium of around EUR 40/t. With both world and EU prices increasing slightly, this margin is expected to be preserved throughout the projection period.

### Declining food use puts pressure on sugar consumption

Direct human consumption corresponds to 85% of the total EU domestic consumption. A declining trend in sugar consumption for food uses, mainly driven by health concerns and affecting the soft drinks and confectionary markets, is set to continue in the outlook period. The sugar price increase is expected to make isoglucose and especially non-caloric sweeteners more competitive and help increase their consumption.

Sugar for non-food uses, which has a share of about 15% of total sugar consumption, would see different developments: sugar exports in processed products will continue to grow, while industrial use will be stable. Overall, the total use of sugar is projected to decline to 16.0 million t by 2030 (-.4% per year)<sup>57</sup>.

Within this context, the analyzed "Assessment of growth potentials for main agricultural products" Country reports (chapter 4.4 Sugar beet) was focused on area and yield developments results in total production, dynamics of domestic consumption; covering of the consumption from domestic production and / or imports, trade - Intra-Community trade and exports / imports outside EU, also medium-term outlook, based on available data and forecasts.

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<sup>57</sup> EC (2020), EU agricultural outlook for markets, income and environment, 2020-2030. European Commission, DG Agriculture and Rural Development, Brussels



The main elements identified, by country, are found in the following, while details are found in each of the country reports.

## AUSTRIA

The drought and above-average temperatures in Austria in year 2019 (especially in the eastern region) affected the yields of sugar beets (2.99 million tons, -8,6% compared to 2018)<sup>58</sup>. The area under cultivation was of 27.528 ha (-12% compared to 2018). There are approximately 4.500 agricultural businesses with an average cultivation area of 6,1 ha.

The largest cultivated areas in year 2020 were in Lower Austria (17.822 ha), followed by Upper Austria (6.243 ha) and Burgenland (1.898 ha).

Generally, we note a decrease in cultivated areas, due to meteorological changes, pests, the water/rain needs of the sugar beet plant and a generalised surplus of sugar beets on the world markets, impacting sugar prices. The current cultivated area with sugar beets in Austria has scaled down to the area cultivated in year 1995.

In the past 15 years, sugar beets have shown an increase in the annual yield of more than 2%, noticeably greater than other cultures.<sup>59</sup> In Austria, sugar beet farmers are supported with three-year contracts and guaranteed purchase prices, compensation in case of pests, etc. There are also funds and incentives especially for the organic sugar beets, with AGRANA creating a supportive framework for the small farmers.<sup>60</sup> Austrian sugar beet farmers hold 15% of the AGRANA company.<sup>61</sup>

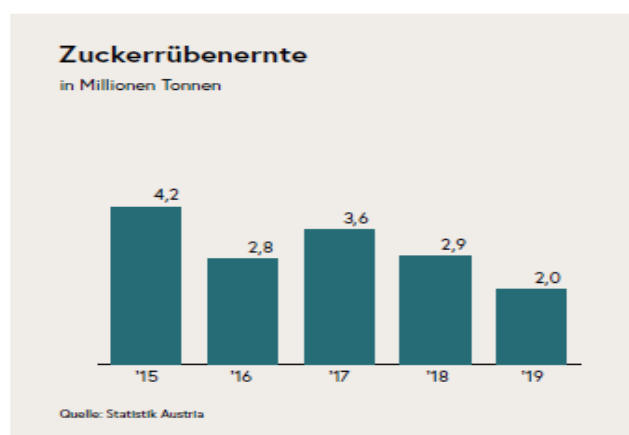


Figure 20: AUSTRIA - Yields' development for sugar beets in million tons<sup>62</sup>

<sup>58</sup> Grüner Bericht 2020, Federal Ministry of Agriculture, Regions and Tourism, p. 12

<sup>59</sup> <https://ooe.lko.at/zuckerr%C3%BCbe-gewinnt-an-wettbewerbsvorteil+2500+3260178>

<sup>60</sup> <https://www.bio-austria.at/a/bauern/aktuelle-entwicklungen-im-bio-zuckerruebenanbau/>

<sup>61</sup> <https://www.landschaftleben.at/lebensmittel/zucker/herstellung/ruebenzucker-und-ruebenbauern>

<sup>62</sup> Grüner Bericht 2020, Federal Ministry of Agriculture, Regions and Tourism, p. 35

In year 2019/2020, the two sugar plants in Leopoldsdorf and Tulln owned by AGRANA Zucker GmbH produced 300,196 tons of white sugar from the Austrian sugar beets. There is a strong demand for organic sugar beets, for the domestic consumption of organic sugar.

In year 2019, 248 farmers produced 75.000 tonnes of organic sugar beets on 1.700 ha cultivated area. This quantity was processed into 9.000 t organic sugar.<sup>63</sup>

Generally, from a value perspective, Austria is net exporter of white sugar. From a quantity perspective, Austria is a net importer of white sugar. The imports of sugar and confectionery products accounted in 2019 for 360.400 tons (+2,7 compared to 2018) and the exports accounted for 295.400 tonnes (-9,4% compared to 2018).

## **BULGARIA**

In 2019, sugar beet production for Bulgaria was 0 tonnes. Though Bulgaria sugar beet production fluctuated substantially in recent years, it tended to decrease through 1962 - 2019 period ending at 0 tonnes in 2019. For the period of about 30 years the national production of sugar beet was unprofitable due to low yields and was replaced by imports of unrefined and refined sugar. At present, sugar beet is sown accidentally.

## **CROATIA**

The area used for the production of sugar beet has increased by approximately 20% in the last years, amounting to more than 2% of the arable land. The preferences given to Croatia and other countries in the Western Balkans for sugar exports to the EU resulted in a gradual increase of sugar production. Still the importance of sugar beet production in the overall Croatian agriculture is limited (approximately 1.2% of total GAO). According to the Agricultural Census, approximately 2,450 family farms and 173 business entities have been cultivating sugar beet. On average, these producers have a farm size of 9.3 ha, which is above Croatian average in the crop sector (the size of a family farm was on average 4.4 ha and for business entities 78.4 ha).

In 2012, the production of sugar beet was carried out on 23,502 hectares, while the quantity produced was 960,000 tones. In 2013 the percentage change was 9.45%, increasing the production with approximately 100 000 tones.

Sugar beet yields have been erratic, mostly due to the weather conditions and relatively poor technology.

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<sup>63</sup> Grüner Bericht 2020, Federal Ministry of Agriculture, Regions and Tourism, p. 35

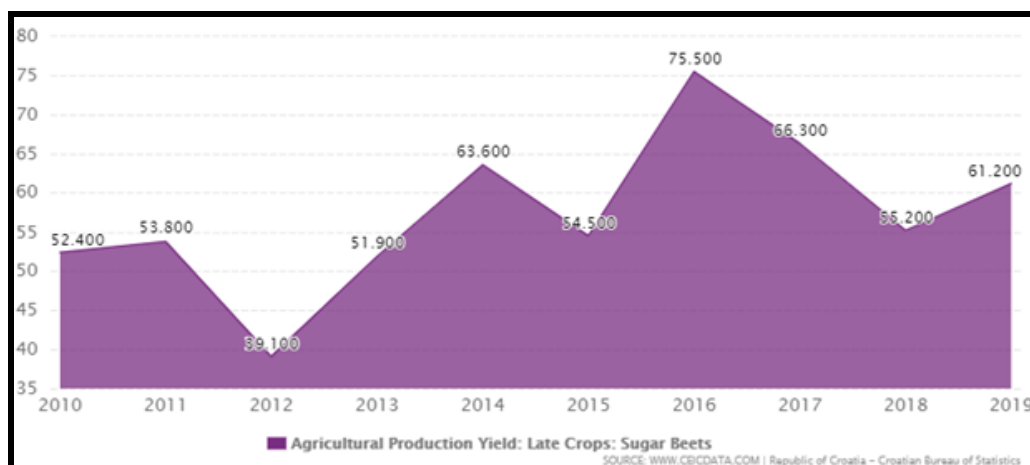


Figure 21: CROATIA - Agricultural Production Yield of sugar beets 2010 - 2019

## REPUBLIC OF MOLDOVA

Information on areas sown with sugar beet, production and average harvest for the period 2012 to 2019 is given in the table below.

Table 20: REPUBLIC OF MOLDOVA - Area sown with sugar beet, production and average harvest, 2012-2019<sup>64</sup>

	2012	2013	2014	2015	2016	2017	2018	2019
<b>Area sown, thousand ha</b>	31	29	28	22	21	24	20	15
<b>Production, thousand tonnes</b>	597	1009	1356	538	665	876	707	607
<b>Average harvest, quintals/ha</b>	192	356	499	253	326	370	373	400

According to NBS data, in 2019, the area sown with sugar beet amounted to 15 thousand ha, representing a decrease of about 5 thousand ha compared to 2018 (20) and 16 thousand ha respectively compared to 2012 (31).

Thus, in 2019, the Republic of Moldova harvested 607 thousand tonnes – sugar beet, which constitutes a decrease of 100 thousand tonnes compared to 2018 (707). Granulated sugar production registered a volume of 86.9 thousand tonnes in 2019, which is an increase of 13 thousand

<sup>64</sup> Source BNS (2021)

tonnes compared to 2018 (73.9). According to UPZM, sugar sales are affected by high production costs, smuggled through Transnistria and patent-based trade.

In 2019 agricultural enterprises produced the main part of the sugar beet volume - 90.9%, and 8.7% were produced by peasant households (farmers) according to the structure of the global harvest.

Depending on the fluctuation in demand and price on the regional market, it is forecast that the area sown with sugar beet will steadily increase to 24 thousand ha and global production will reach about 20 000 ha. 900 thousand tonnes by 2030.

## REPUBLIC OF SERBIA

Table below shows decrease of harvested area and total production but increase of yield per hectares of sugar beet. Yield per hectares growth from 46.7 ha/t in 2017 to 53 ha/t in 2020, while harvested area decrease from 53,857 ha in 2017 to 37,418 ha in 2020.

*Table 21: REPUBLIC OF SERBIA - Sugar beet: Area harvested, production and yield per year*

Sugar beet			
Years	Area harvested, ha	Production, t	Yield ha/t
2017	53,857	2,513,495	46.7
2018	48,125	2,325,303	48.3
2019	42,539	2,305,316	54.2
2020	37,418	2,018,215	53.9

## SLOVAKIA

Total production of sugar beet slightly decreased in past 5 years. Majority of production is consumed in Slovakia by sugar-producing facilities. Since production is more or less relevant to production, import is not necessary. Export presents max. 10% of production. Since sugar producing facilities are owned by supranational corporations, any overproduction is consumed by the nearest facilities abroad. Main transport mode for sugar beet is railway transportation. Due to fragility of sugar beet after harvest, it is processed as nearby as possible. After that, properly packed sugar may be transported on greater distances.

In 2018/19 marketing year, 206 growers grew sugar beet. Sugar beet was grown on an area of 21.94 thousand. ha. With an average yield per hectare of 60.96 t / ha, beet production was achieved in the volume of 1,337.29 thous. t. The average sugar content was at the level of 15.43%, the yield of

polarizing sugar was 9.41 t / ha and the yield of white sugar was 7.84 t / ha. The Statistical Office of the Slovak Republic states the price of beets (including subsidies) in 2018 by 2.5% higher than in 2017, reaching the level of € 25.70 / t. In 2019, it fell by 0.8% to € 25.50 / t. The price of beet decreased by 6.5% to € 23.00 / t in 2018 and the decrease continued in 2019, when the price of beet decreased by 4.4% to € 22.00 / t.

The total consumption of sweeteners, which also includes sweeteners in products and sweetened beverages, expressed in sugar equivalent in 2018 in Slovakia amounted to 169,638 t, which was 12,163 t less than in 2017. Consumption of sugar and sweeteners per capita was 31.2 kg, ie 2.2 kg less than the year before.

## **HUNGARY**

In 2020, the area of sugar beet harvested continued to decline as in the previous years. The area of 13,000 acres was 7.4% less than in the previous year and almost 19% less than the average of the previous five years. In addition to declining areas and drought, viral diseases in sugar beet have also led to lower yields, with farmers harvesting only 760,000 tonnes, 7.7% less than the previous year. The average yield of sugar beet was 58.3 tonnes / acre, which is 6.4% lower than the average of the previous five years.

Typically Hungary do not need imports from sugar beet, but have exports. In 2019 Hungary exported 125,442 tonnes, which is a significant increase compared to 110,602 tonnes in 2018, but not an outstanding performance considering the long-term average.

## **4.5 Feed**

### **Transition ahead in EU feed demand**

Feed is the primary outlet for EU cereals and is expected to face some changes in the next 10 years. It is projected that overall feed demand (without grass) could slightly decline, by 0.5% in the outlook period.

With the expected decline in the EU pigmeat production (-4.6% by 2030), feed demand should drop in this sector. By contrast, the poultry sector should grow and could boost feed demand. For ruminants, even if suckler cows and the dairy herd are projected to decrease in numbers, further production growth in milk should sustain the feed demand. The ongoing restructuring of the dairy sector will continue, and EU Member States with lower productivity should further close the gaps with more efficient and intensive production systems. At the same time, extensification and diversification of production systems will expand in certain regions of the EU, favouring some specialised systems along the value chain (organic, pasture-based, GM-free, short supply chains) (see section on Milk). In 2019-2020, 45% of the proteins for livestock feed already come from grass.

## High-protein meals usage to decline

Low-protein feed (less than 15% protein content, mainly cereals) is the largest contributor of EU feed rations in volume and represents 76% of the feed mix<sup>65</sup>. The overall use of cereals in feed is projected to slightly decline to 162.2 million t (-0.2% compared with 2020<sup>66</sup>). High-protein feed (over 30% protein content) includes oilseed meals, fish meals and skimmed milk powder. It is projected that the use of high-protein feed, particularly of oil meals, could slightly decrease by 2030 (-0.2%). The decline in pig and other livestock herds will contribute to the downward trend in 2030, as will the fall in rapeseed availability and environmental and climatic concerns vis-à-vis soya utilisation in feed rations. By contrast, the use of medium-protein feed (between 15-30% protein content, such as protein crops) is expected to increase by 2030. Protein crops' usage in feed rations could grow by 18.7% compared to the 2020 and partially replace oilseed meals.

## Prices to appreciate in the longer run

With ample global availabilities and low fuel prices (and thus low transportation costs), feed prices should decline at the beginning of the outlook period. Prices in nominal terms are expected to increase once the economy is assumed to have recovered from the dip in GDP growth resulting from the COVID-19 crisis.<sup>67</sup>

Within this context, the analyzed "Assessment of growth potentials for main agricultural products" Country reports (chapter 4.5 Feed) was focused on developments results in total production, dynamics of domestic consumption; covering of the consumption from domestic production and / or imports, trade - Intra-Community trade and exports / imports outside EU, also medium-term outlook, based on available data and forecasts.

The main elements identified, by country, are found in the following, while details are found in each of the country reports.

## AUSTRIA

In year 2019, there were 112 Austrian companies (commercial and industrial) producing approximately 1,83 million tons compound animal feed (+3,7% compared to 2018).<sup>68</sup> From the total production, 64% accounts for premixes for cattle, pigs and poultry and approximately 18% for mineral and protein feed.

In year 2019, Austria exported 561.629 tons of feed. This represents to 23% of the total production of compound feed.

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<sup>65</sup> [EU feed protein balance sheet](https://ec.europa.eu/info/food-farming-fisheries/farming/facts-and-figures/markets/overviews/balance-sheets-sector/oilseeds-and-protein-crops_en) - [https://ec.europa.eu/info/food-farming-fisheries/farming/facts-and-figures/markets/overviews/balance-sheets-sector/oilseeds-and-protein-crops\\_en](https://ec.europa.eu/info/food-farming-fisheries/farming/facts-and-figures/markets/overviews/balance-sheets-sector/oilseeds-and-protein-crops_en)

<sup>66</sup> 2020 represents the 2018-2020 average

<sup>67</sup> EC (2020), EU agricultural outlook for markets, income and environment, 2020-2030. European Commission, DG Agriculture and Rural Development, Brussels

<sup>68</sup> Grüner Bericht 2020, Federal Ministry of Agriculture, Regions and Tourism, p. 18



## **BULGARIA**

Although the potential of Bulgarian feed production is not fully developed, there are good conditions and raw materials, and Bulgarian feed is as good as quality to those produced in Europe and the world.

### **Manufacturing of compound feed**

In 2019, pursuant to Art. 14b of the Feed Act produced a total of 1,116,259.15 tonnes of compound feed (according to data from manufacturers of compound feed), which is 0.3% more than the previous year.

### **Medicated feed production**

Throughout 2019, in the country, 35 830 tonnes of medicated feeds were produced for pigs only. Compared to 2018, there was a decrease in production by 4.6%. The share of the production of medicated feeds for the needs of own farms was 57.2% of the total quantity produced in 2018 and that of the produced for the market - 42.8%. The ratio in 2018 was 59.8% to 40.2%.

## **CROATIA**

Year 2020's wheat yield is likely to be significantly higher than last year, going from 6-5 tonnes per hectare in small farms to 10.5 tonnes per hectare in fields cultivated by big agribusinesses.

Under the regulations adopted for quality parameters, wheat is graded in five categories from premium to quality No. 4 as the lowest, according to test weight, the content of foreign material, protein content, and so on.

Though Croatia sunflower production fluctuated substantially in recent years, it tended to increase through 2000 - 2019 period ending at 106,560 tonnes in 2019. Fluctuations were fairly exponential resulting in decreases followed by the increases which are approximately 10% higher than the previous highs.

Coarse grain production in Croatia follows a similar pattern as wheat production, printing higher highs and higher lows throughout the last decade. During the overall market collapse in 2008, coarse grain production in Croatia printed its local peak contributing to the market with 2.868.417 tonnes of coarse grains (aggregated).

Regarding the import value of cereal brans in Croatia, certain trend can be spotted. Post war period was defined as a poor production time frame after a complete stop in the early nineties. Emerging patterns started to appear in the late ninties, while the early 2000's almost presented a text-book example of vertical growth peaking at around \$2.200.000 million in import value.

Export quantity of cereal brans sees a general uptrend during the last decade, while the decade before the last one was characterized with major swings in quantity of exported cereal brans. After the period of early nineties where export seemed fairly good, sharp decline followed all the way towards early 2000's. After the sharp downtrend finished, huge spike in export took place setting a local peak of 2.350 tonnes in 2002. Due to the fact that kind of growth pattern was unsustainable, vertical drop occurred. Since mid 2000's general uptrend is taking place, with minor consolidation periods in between.

Viscous product resulting from refining sugarcane or sugar beets into sugar. Molasses varies by the amount of sugar, method of extraction, and age of plant. After the initial growth phase until 2007, production of molasses experiences a slow but continual downtrend averaging about 70.000 tonnes produced in Croatia. Import values continue to decrease printing higher lows while the export value continues to print higher highs in the attached chart.

Field peas yield in EU standard humidity conditions during the last decade was represented by fluctuations which could objectively be described as two years in a uptrend followed by 2 years in a downtrend, while the overall trend is moving in a upward direction signaling that the market moves in a healthy pattern of growth phases followed by minor corrections or consolidator phases.

Rather modest data available on broad beans and horse beans result in creation of a simple graph which indicates a linear growth from 2018 to 2019 of 0.02%. Due to lack of data, further analysis of the trend patterns is currently unavailable.

Oilseed cakes and meals are the residues remaining after the removal of the greater parts of the oil from oilseeds. Oilseed cakes are rich in proteins, dietary fibers, other bioactive compounds such as colorants, antioxidants, and other substances with positive health benefits, which make them suitable for valorisation either as human food or feed.

Import value of oilseed cake and meal sees an overall uptrend and a continuous growth in consumption in Croatian agriculture. Peak value of import was in 2014 when the valuation of imported oilseed cake and meal amounted to \$120.5 million dollars.

Export value was kept on rather modest values all throughout the period from early nineties towards 2013. In 2014 huge escalation in export value established itself with a whopping 475,61% growth within a year. The uptrend continued for two years, and since then started to form a downtrend.

Skimmed milk is made when all the milkfat is removed from whole milk. It tends to contain around 0.1% fat. Skimmed milk production in Croatia tended to have stable production levels all the way from early nineties towards 2006 – 2007 when an uptrend ensured causing the production levels almost triple in value in the coming years. Import levels were on a rise from the nineties, currently peaking at almost \$3.000.000 in import value. Export quantity started the period of Croatia's independence with an uptrend only to completely diminish in the late nineties. Early 2000's marked a significant demand period printing out approximately 15.000% rise in export demand. From that point on, mild downtrend ensured.

## REPUBLIC OF SERBIA

Table below shows decrease of harvested area and total production OF 2020 comparing with 2019 but increase of yield per hectares feed of maize for fodder.

*Table 22. REPUBLIC OF SERBIA - Maize for fodder: Area harvested, production and yield per year*

<b>Maize for fodder</b>			
Years	Area harvested, ha	Production, t	Yield ha/t
2017	33,244	534,521	16.1
2018	29,831	588,178	19.7
2019	37,401	763,354	20.4
2020	35,663	746,926	20.9

## SLOVAKIA

The situation in animal production in Slovakia is also reflected in the production of compound feed<sup>69</sup>. Although the numbers of cattle and pigs have increased, the number of sheep and especially poultry has decreased, which has ultimately affected the production of compound feed and thus the consumption of individual feed components. In the 2019-20 marketing year, the total supply of industrial feed intended for the production of compound feed in Slovakia was 700.6 thousand. t, of which domestic production was 228.6 thousand. t and a total of 683.6 thous. t of industrial feed. 651.3 thousand were produced. t of feed mixtures, for the production of which components were used in the amount of 421.0 thous. t of cereals, 1.8 ths. t of pulses and 232.3 thous. t of industrial feed. In the first half of 2020, we record not only a decline in cereal prices, but most feed components. This uneven development was reflected in a significant variance in the average prices of individual types of compound feed. Prices ranged from 86.6% (KZ OŠ 05 to 09) to 109.2% (KZ HD 01, 02) of their level from 2019. Given the expected slight increase in the number of pigs, with the stabilization of stocks in the poultry, sheep and HD sector, we assume in the 2020-21 marketing year the volume of compound feed production above the level of the previous marketing year.

<sup>69</sup> Situation and outlook report – Industrial feed, National Agricultural and Food Centre, Research Institute of Agricultural and Food Economics, ISSN 1339-0929, 11/2020

In the financial year 2019-20, approximately 165.4 thousand t were produced. t of mill feed. Of this amount, 160.7 thousand t (97.2%) of mill feeds from wheat and 4.7 thousand t of rye. 29.6 thousand t were produced. t of feed flour, 107.5 thousand t bran, 25.0 thousand t of scrap and 3.2 thousand t of keys. Compared to the 2018-19 marketing year, there was a slight year-on-year increase in the production of mill feed by 2.5%.

In the financial year 2019-20, a total of 232.3 thousand t of industrial feed (without cereals) were consumed. As every year, soybean extracted meal followed consumption, followed by rapeseed meal, mineral supplements, sunflower meal and premixes. Compared to the 2018-19 marketing year, the consumption of industrial feed increased by up to 10.6 thousand t (by 4.8%).

Enterprises of the feed industry consumed 96.1 thousand t of industrial feed and selfproducers 136.2 thousand t. Compared to the 2018-19 marketing year, consumption has increased in enterprises of the feed industry by 3.6% and in selfproducers by up to 5.6%. When comparing the individual quarters of the 2019-20 financial year, we can state that the highest consumption was in the 3rd quarter of 2019 and the lowest in the 4th quarter of 2019.

According to the data of the Statistical Office of the Slovak Republic, a total of 453.1 thousand t were imported in the 2019-20 financial year. T residues and waste from the food industries (tariff item 23). In the first half of 2020, a total of 214.7 thousand t of residues in the total value of 103.9 mil. EUR. In the financial year 2019-20, 447.5 thousand t were exported. t of industrial feed. Exports in the first half of 2020 reached 228.8 thousand t in the value of 52.8 mil. EUR. Compared to the 2018-19 marketing year, imports increased by 1.8% in the 2019-20 marketing year, but exports decreased by 1.7%. In the 2019-20 marketing year, animal nutrition preparations in the amount of 221.5 thousand t contributed the most to imports. t and soybean extracted meal in the amount of 95.2 thousand t. Together, these two items accounted for 69.9% of total imports. The most exported starch residues were 207.4 thousand t, bran in the amount of 78.1 thousand t and rapeseed extracted meal in the amount of 70.7 thousand t.

## **HUNGARY**

The area for fodder crops decreased slightly by 3.4% compared to 2018, despite the spread of alfalfa (commonly known as lucerne). While silo maize, mixed fodder and red clover were sown less, the area of seasonal turf increased by almost 8.9 thousand acres (14%). The sowing of fodder crops is mainly related to animal husbandry, so it is most typical in Hajdú-Bihar county and Bács-Kiskun county. In addition, a significant amount of hay and green fodder is harvested in Central Hungary, from a total of 31.5 thousand acres (9.0% of the national area).

## 4.6 Biofuels

### **Fuel demand to decrease, with biofuels less impacted than conventional fuels**

National lockdowns and travel restrictions in response to the COVID-19 pandemic resulted in a sharp decrease in demand for transport fuels. Total fuel use, which decreased by 10% in 2020, is expected to rebound in the near term. In the medium term, however, the decline in the fuel use is expected to become apparent due to a combination of improving fleet efficiencies, green recovery policies and consumer shift to alternative modes of transportation.

The decline in fuel use will affect the demand for biofuels, but increasing blending rates will mitigate the impact. By 2030, when conventional fuel demand will be facing a decline of 19% compared to 2020, biodiesel demand could decline by 10%, while demand for bioethanol should remain 8% above the 2020 level.

### **Palm oil the most affected biodiesel feedstock due to certification woes**

Declining biodiesel use will have varied effects on the different feedstock used for biodiesel production. Rapeseed oil will maintain its status as the primary source, whereas the share of palm oil share will significantly decline – from 23 % in 2020 to 11% in 2030 – due to difficulties in certifying it as a low indirect land use change (ILUC) biofuel feedstock. With the ongoing shift to renewable biodiesel and maturation of technologies for production of advanced biofuels, waste-related feedstock should expand, although with a limited impact on total biodiesel production.

For bioethanol production, waste and residues will be the fastest growing feedstock, albeit with limited overall impact. Use of sugar beet is also expected to increase slightly due to improved competitiveness, while the shares of the main bioethanol feedstock – maize and wheat – are expected to remain stable.

### **Lower imports due to tariff measures, shift in feedstock structure**

The EU will remain a net importer of biofuels throughout the projection period, although imports are expected to decrease in line with lower fuel use. In the near term, biodiesel imports will be constrained by ongoing countervailing duties applied to certain imports from Argentina and Indonesia, while in the longer term this trend is likely to be prompted by decreasing use of palm oil as a biodiesel feedstock. For ethanol, the rebound in biofuel use and increase in demand for pharmaceutical purposes should provide a short-term import boost.<sup>70</sup>

Within this context, the analyzed "Assessment of growth potentials for main agricultural products" Country reports (chapter 4.6 Biofuels) was focused on developments results in total production, dynamics of domestic consumption, also medium-term outlook, based on available data and forecasts.

The main elements identified, by country, are found in the following, while details are found in each of the country reports.

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<sup>70</sup> EC (2020), EU agricultural outlook for markets, income and environment, 2020-2030. European Commission, DG Agriculture and Rural Development, Brussels.

## AUSTRIA

The volume-related most important raw material of the Austrian biofuel market is rape (65%), followed by soy and corn with approx. 10% each.

### Biodiesel

In 2019 there were eight biodiesel producers in Austria, with a total production of 299.377 tons of biodiesel. The produced quantity covered 62% of the domestic consumption of sustainable biodiesel in 2019.<sup>71</sup>

Rapeseed oil had of 25% share in the production of biodiesel. Soy and sunflower oil only play a subordinate role. Most of the raw materials originate from Austria (23,2%). Raw materials are also imported from the Czech Republic (15,9%), Slovakia (15,6%), Italy (14%), Hungary (8%) and Germany (5%).

Overall, Austria has a biodiesel production capacity of almost 485.000 tons.<sup>72</sup>

### Bioethanol

Austria has one large industrial plant for bioethanol production operated by AGRANA Beteiligungs-AG in Pischelsdorf in the state of Lower Austria.<sup>73</sup> The plant has currently a capacity of approx. 200.000 tons. In addition to bioethanol, up to 190.000 tons of DDGs (Distiller's Dried Grain With Solubles) - a protein-rich feed - are generated in Pischelsdorf per year.<sup>74</sup>

In year 2019, the plant produced 201.476 tons of bioethanol from approximately 600.000 tons of cereals (currently mainly wheat and corn). This quantity represents 233% of the domestic sales volume.

In 2019, Austria imported a total of 658.330 tons of biofuels and exported 541.347 tons. Austria imported 549.347 tonnes of biodiesel and 61.616 tonnes of bioethanol and exported 402.351 tons of biodiesel and 230.675 tons of bioethanol. With about 21%, Germany is the raw material cultivation country number one for biodiesel (mainly from rapeseed), followed by France, Czech Republic and Ukraine and Hungary (12%, 11% or around 10% each).<sup>75</sup>

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<sup>71</sup> Biokraftstoffe im Verkehrssektor 2020, Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology, p. 25

<sup>72</sup> <https://www.biokraft-austria.at/#biokraftstoffbericht>

<sup>73</sup> <https://www.agrana.com/produkte/alle-produktportfolios/bioethanol>

<sup>74</sup> Biokraftstoffe im Verkehrssektor 2020, Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology, p. 27

<sup>75</sup> Biokraftstoffe im Verkehrssektor 2020, Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology, p. 40



## **BULGARIA**

The maximum admixture of bioethanol has remained at a fixed figure since March 2019 at 9%. Since April 2019, the share of biodiesel should be on a minimum level 6%, where 1% of this amount must be second generation biodiesel produced from algae biomass, waste biomass from households and industry, agriculture and by-products.

There was a boom of the biofuels sector in Bulgaria during the period between 2003-2012, whereas around ten biodiesel plants and six bioethanol plants were built based on feedstocks from renewable crops (rapeseed, sunflower, wheat and maize).

However, despite the fixed quota for mixing of biofuels, and due to the difficult market situation, higher prices of biofuels compared to fossil fuels and the lack of financial support (subsidies), currently very few of these plants are still existing and mainly producing biodiesel and ethanol for export in other countries. Some of the biofuel plants, which are still under operation, can be summarised as follows:

- Biodiesel plant in Slivo Pole, 20 km eastwards from Ruse, managed by ASTRA BIOPLANT Ltd. with an annual capacity of 60,000 t of biodiesel, this accounts for 60% of the demand for biodiesel in Bulgaria. This company is also able to produce biodiesel from second-generation feedstocks, mainly from kitchen oil and remnants from the production of acid oil; however, the feedstock is mainly imported from Asia and neighboring countries (Romania and Greece). In Bulgaria, there is currently no plant for the production of advanced fuels being implemented. Over 50 percent of the biodiesel produced by Astra Bioplant is exported. Clients of the plant are traders from Hungary, Italy, Germany and other countries.

- the bioethanol plant operated by Almagest for production of ethanol from grains is located 35 km South-West of Sofia near the town of Ihtiman. The plant has an annual capacity of 30 M litre of ethanol, which can be used for biofuel and for the production of products in the food and cosmetic industry.

- the largest oil refinery positioned in the Balkan Peninsula exists in Burgas, the south-eastern region of Bulgaria. The refinery is owned and operated by Lukoil, and mainly utilises imported oil. Lukoil is the main supplier of fuels supporting the domestic market for the Republic of Bulgaria. In 2018, Lukoil imported and processed around 6 M tons of crude oil, from which approx. 2 M tons of fuels were sold on the domestic market, while more than 3 M tons were exported.

About 100,000 tons of biodiesel are consumed annually in Bulgaria. For their production about 200,000-250,000 tonnes of oilseeds are needed.

## **CROATIA**

Within the biofuels production sphere in Croatia, biodiesel was the only contender. In the early 2000's biodiesel production was non-existent only to start its reign in 2006. Strong uptrend continued for almost a decade when a sharp decline ensued bringing the biodiesel production level back to the non-existent levels from twenty years ago. During the peak of production in Croatia, in 2012, Croatia manufactured up to 700 barrels per day, which is roughly 111.291 litres.

## **REPUBLIC OF MOLDOVA**

In 2019, in the Republic of Moldova the consumption of biofuels and waste was 628, which constitutes about 23% of final energy consumption, and represents a reduction of 136 compared to 2018 (764).

## **REPUBLIC OF SERBIA**

Directive 2009/28/EC, which refers to the required content of biofuels in motor fuels, in order to reduce the greenhouse gas emissions, has not been implemented in domestic legislation yet. By the Action plan for building new capacities based on renewable energy sources is assumed obligation to reach 10% of the share of biofuels in motor fuels by 2020, but the share of biofuels in the oil products was still negligible.<sup>76</sup>

## **SLOVAKIA**

Biofuels consumption for transport in Slovakia peaked at 175.4 kilotons of oil equivalent in 2017. By 2019, figures decreased by 30 kilotons of oil equivalent. At that time, the country biodiesel consumption was at 127.9 kilotons of oil equivalent. The amount of bioethanol consumed was significantly smaller compared to biodiesel.

The target set in the National Action Plan for Energy from Renewable Energy Sources at the level of 14% of gross final energy consumption by 2020 has not yet been achieved. Construction of biogas plants stagnated.

## **HUNGARY**

Hungary wish to reduce the growth of GHG emissions in the transport sector by increasing the blending ratio of biofuel, supporting the spread of electric vehicles, and diverting traffic towards low-emission modes of transport.

By 2030, advanced (second-generation) biofuels will account for the largest share of renewable energy use (53%), while first-generation biofuels will account for 14% of renewable energy use in the transport sector. The share of electricity is expected to be 21% in 2030. By the end of the 2020s, hydrogen will also become a significant factor.

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<sup>76</sup> Security of Supply Statemet – Republic of Serbia

## 4.7 Fertilizers

The EU Commission's Green Deal 'Farm-to-Fork' and 'Biodiversity' strategies put forward the ambition for 2030 to reduce nutrient losses to the environment from both organic and mineral fertilizers by at least 50%, while ensuring no deterioration in soil fertility.

This ambitious target together with other EU objectives such as achieving 25% of organic farming are expected to result in a reduction of fertilizers use, which is also reflected in the downward trend of the nutrient use figures reported in Fertilizers Europe 10-year forecast.

However, an adequate supply of nutrients must be guaranteed to ensure optimal crop growth and healthy soil.

Over the season, fertilizers containing an average of 11.2 million tons of nitrogen, 2.7 million tons of phosphate, and 3.1 million tons of potash were applied to 133.7 million hectares of farmland. 44.9 million cultivable hectares in the EU were not fertilized.

Consideration of the economic outlook and the anticipated evolution of Europe's cropping area has led to expect annual nitrogen, phosphate and potash fertilizer consumption to reach 10.6, 2.7 and 3.1 million tons respectively by the 2029/2030 season, applied to 132.4 million hectares of farmland. After several years of recovery, annual fertilizer consumption over the next 10 years is foreseen to decrease for the fourth consecutive year.

Over the next ten years, nutrient consumption (N+P+K) for agriculture is forecasted to decrease by -4.1 %.

Nitrogen suffers from the steepest downturn. For phosphate the forecast now predicts, after some years of recovery, a downturn as well, even though more moderate compared to nitrogen. For potash, a slight increase of the consumption is forecasted.

Nevertheless, phosphate and potash consumption will continue to remain below the levels recorded prior to the 2008 economic downturn. This is partly linked to a deterioration of agricultural prices.

In recent years, a more challenging climate situation seems to have a growing negative influence on yield expectations. In addition, the tightening of the environmental regulatory framework limits productivity growth. The ban of one single input factors often drags down the use of the other input factors as well. The political priorities of the European Union and of several European countries are challenging EU's farming sector as a whole and fertilizer use by farmers as well.

Within this context, the analyzed "Assessment of growth potentials for main agricultural products" Country reports (chapter 4.7 Fertilizers) was focused on developments results in total production, dynamics of domestic consumption; covering of the consumption from domestic production and / or imports, trade, also medium-term outlook, based on available data and forecasts.

The main elements identified, by country, are found in the following, while details are found in each of the country reports.

## **AUSTRIA**

2018/19 there were 2 companies in Austria producing fertilizers: Borealis Polyolefine GmbH in Linz and Donau Chemie AG in Pischelsdorf. The total production was of approximately 1.5 million tons (corresponding to approx. 375 million EUR). 80% of the produce was exported.<sup>77</sup>

It is expected that the national use of fertilizers in Austria will sink, due to the growth of organically cultivated areas (currently 20% of the total arable area) and the further growth of extensive cultures (soybeans, less rapeseeds, less sugar beets).

80% of the national produce of fertilizers 2018/19 was exported.

The medium-term development of the national use of fertilizers until 2030 will be impacted by the measures implemented through the European Green Deal and the CAP. The Green Deal follows two strategies in creating a modern, resource-efficient and competitive agriculture: the Farm-to-Fork strategy and the EU's biodiversity strategy for 2030. This sets a focus on organic agriculture and the reduction of the use of pesticides, fertilizers and antibiotics in the agri-food production process. The CAP encourages low-input farming in the EU, with a focus on the conscious use of pesticides, reduction of nitrates from agricultural production and further support of the organic farming.<sup>78</sup>

## **BULGARIA**

Bulgaria does not have any phosphorus resources and is dependent on imports. Recycled mineral phosphorus products are neither produced nor used in the country. Mineral phosphates fertilizers are imported or directly produced in Bulgaria.

Currently there are two major fertilizer producers in Bulgaria - Neochim PLC and Agropolychim JSC. They act as wholesalers and retailers. There are four other important wholesalers and many other smaller ones. A lot of wholesalers import part of their products from abroad, but Neochim PLC and Agropolychim JSC sell only their own products.

Fertilizers are imported to Bulgaria from Greece, Romania, Morocco. In the course of 2019, a total of 144,632,771 kg and 65,760 l of fertilizers were imported to Bulgaria through the border crossing point.

In 2019, Bulgaria imported USD 306 mln in fertilizers, becoming the 43rd largest importer of Fertilizers in the world. At the same year, fertilizers were the 25th most imported product in Bulgaria. Bulgaria imports fertilizers primarily from: Egypt (USD 37.8 mln), Morocco (USD 35.8 mln), Greece (USD 32.2 mln), Romania (USD 30.2 mln), and Russia (USD 25.7 mln).

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<sup>77</sup> Grüner Bericht 2020, Federal Ministry of Agriculture, Regions and Tourism, p. 18

<sup>78</sup> Grüner Bericht 2020, Federal Ministry of Agriculture, Regions and Tourism, p. 241 and [https://ec.europa.eu/info/food-farming-fisheries/sustainability/environmental-sustainability/cap-and-environment\\_en](https://ec.europa.eu/info/food-farming-fisheries/sustainability/environmental-sustainability/cap-and-environment_en)

In 2019, Bulgaria exported USD 266 mln in fertilizers, making it the 37th largest exporter of fertilizers in the world. At the same year, fertilizers were the 30th most exported product in Bulgaria. The main destination of fertilizers exports from Bulgaria are: Romania (USD 135 mln), Ukraine (USD 62.5 mln), India (USD 18.9 mln), Brazil (USD 9.22 mln), and France (USD 7.57 mln).

The fastest growing export markets for Fertilizers of Bulgaria between 2018 and 2019 were Ukraine (USD 54.4 mln), Romania (USD 17.9 mln), and France (USD 7.37 mln).

Fertilizer production is already sufficiently affected by the Emissions Trading Scheme, and the plans for further decarbonisation to be implemented in the period 2021-2030 will further hit European producers with a tendency for industry to move production to more low-risk regions - outside the EU.

## **CROATIA**

Fertilizer production rates in Croatia keeps averaging around 375.000 tonnes annually. In the period of early nineties (1992 – 1993) decline occurred, after which the uptrend ensured in the following five-year period. 1998 marked again a year in which the production rates were suboptimal causing a 17% drop. Two-year period after that was in an uptrend causing a consolidation period to take place. Sharp decline marked the following period. Due to lack of relevant data, present day analysis and statistical inputs were lacking. If the data were to be attained, updates will be made.

## **REPUBLIC OF MOLDOVA**

The Republic of Moldova does not produce chemical fertilizers, thus covers domestic demand mainly from imports from countries such as: Belarus, Ukraine, the Russian Federation, Romania, Germany and China.

Over the past three decades, the number of animals and poultry has steadily decreased, which has contributed to a decrease in the production capacity of natural fertilizers. The analysis of statistical data shows a bleak picture of the average volume of natural fertilizers administered per hectare. If no measures are taken immediately to remedy the situation created, there is a risk that the Republic of Moldova will import also natural fertilizers in the long term.

The volume of chemical fertilizers increased steadily between 2000 and 2019. In 2019 94.3 thousand tonnes of chemical fertilizers were administered, including: 64.1 thousand tonnes - nitrogen, 21.2 thousand tonnes - phosphates and 9 thousand tonnes - potash respectively.

By 2030, the share of the area fertilized with chemical fertilizers is expected to increase, thus depending on the fluctuation of supply and price on the regional market, the import volume will double compared to 2019.

Also, by 2030 it is forecast that both the volume of organic fertilizers introduced on average per 1 hectare of seeds from 0.08 to 0.02 t/ha will increase steadily, as well as the share of the area fertilized with organic fertilizers from 0.38 to 10%. Thus, it is estimated that in the area there will be

used approx. 150 thousand tonnes/year. Domestic demand for organic fertilizers is much higher than their production capacity, but agricultural enterprises and peasant (farmer) households are not willing to pay for their import.

## **REPUBLIC OF SERBIA**

Total production of fertilizers in 2019 was 550,000 tonnes, which is 14% higher than production in 2017.

40% of production in 2017 and 2018 consisted of nitrogen fertilizers, 51-56% complex fertilizers and other fertilizers were marginally present. Total production in 2019 consisted of 75% complex fertilizers, 15% - ammonium phosphates, 10% - other nitrogen fertilizers.

Nitrogen fertilizers are mostly imported from Russia (59%) and significantly smaller quantities are imported from EU countries: Croatia, Austria, Hungary and Romania.

## **SLOVAKIA**

With the changes after 1989 in the agricultural sector (land restitution, rising prices, reduced intensification, legislative measures), there has been a significant decrease in the consumption of industrial fertilizers and pesticides in agriculture. In the period 2005 - 2019, there was a renewed increase in the consumption of nitrogen fertilizers by 67.3%, the consumption of phosphorous fertilizers by 54% and potassium fertilizers by 20.8%. In 2019, the total consumption of industrial fertilizers was 102.8 kg of pure nutrients (No.) per hectare of agricultural land, which was 0.4 kg No. / ha more than in the previous year. Between 2015 and 2019, the consumption of industrial fertilizers with smaller deviations had a growing trend.

## **HUNGARY**

Turnover of compound fertilizers decreased by 12.4% in the first three quarters of 2020 compared to a year earlier. In the third quarter of 2019, the sales of compound fertilizers - in natural weight - exceeded those of one-component fertilizers, while the period under review was characterized by the opposite trend. Although the amount of compound fertilizers increased, it did not reach that of mono fertilizers. In the first half of 2020, 85% of all fertilizers sold (in natural weight) were simple nitrogen fertilizers and only 14 percent were compound fertilizers. In the third quarter, compound fertilizers accounted for 23% of sales, while demand for simple phosphorus and simple potassium fertilizers increased, reaching 0.7% and 2.2%, respectively. The ratio of simple nitrogen fertilizers was 74%. Among compound fertilizers, the highest demand was for NPK 10-26-26 in the first three quarters of 2020, with 45.3 thousand tonnes sold and accounting for 13.3% of the volume of compound fertilizers. The second most popular product was NPK 8-24-24, of which 41,000 tonnes were sold, accounting for 12.1% of compound fertilizer sales for the three quarters. In third place was NPK 15-



15-15, of which 39 tonnes were sold, which accounted for 11.4% of the total amount of compound fertilizers. Other popular compositions were monoammonium phosphate (MAP) (27.8 thousand tonnes, 8.2%) and NP 18-46 (16.7 thousand tonnes, 4.9%).<sup>79</sup>

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<sup>79</sup> Source: <https://agraragazat.hu/hir/tobb-mutragya-kevesebb-forintert/>

## 5 Development Programs (DPs)

### 5.1 Overview of the RDP measures aiming increase of agricultural production and efficiency

The analysis was focus on the impact of these measures on primary agricultural production; in particular, the EU measures and financing was analyzed, based on which projects in agriculture have been carried out, having as object the endowment of farms with tractors and agricultural machines, storage and conditioning capacities of cereals and other crops (silos), etc.

- *for EU Member States PPs* - an analysis of National Rural Development Programs (RDPs) and other programs or measures with direct impact over the growth of the agricultural production;
- *for PP's in countries in the process of joining the EU* - an analysis on IPARD, part of the instrument for pre-accession assistance (IPA), the instrument for pre-accession assistance for rural development (IPARD) focuses on rural areas and the agri-food sectors of those countries; Measures with direct impact over support reforms in countries and the growth of the agricultural production;
- *for PP's in rest of the countries* - an analysis of national agricultural policy and instruments to support the development and growth of the agricultural production.

#### AUSTRIA

Rural Development in Austria is managed nationally through the Rural Development Programme (RDP), funded under the European Agricultural Fund for Rural Development (EAFRD) and supported by national contributions. The Rural Development is the second pillar of the CAP Common Agricultural Policy.<sup>80</sup>

The Austrian RDP was last modified on 7 July 2020.<sup>81</sup> For the 7-year period 2014-2020 Austria had a total budget of 7.9 billion EUR of public money (3.94 billion EUR from the EU budget and 3.76 billion EUR of national co-funding, plus 190 million EUR of additional national funding top-ups). The five biggest RDP measures in budgetary terms 2014 – 2020 were<sup>82</sup>:

- 2 billion EUR for Measure 10 – Agri-Environment Climate Measure
- 1,8 billion EUR for Measure 13 – Payments to areas facing natural or other specific constraints
- 1 billion EUR for Measure 4 – investment in physical assets
- 790 million EUR for Measure 7 – Basic services and village renewal in rural areas
- 784 million EUR for Measure 11 - Organic farming

The Austrian RDP puts emphasis on investments contributing to environmental and climate objectives, through innovations. It is also focused on the preservation of natural resources and

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<sup>80</sup> [https://enrd.ec.europa.eu/country/austria\\_en](https://enrd.ec.europa.eu/country/austria_en)

<sup>81</sup> Here and in following: European Commission, Factsheet on 2014-2020 Rural Development Programme for Austria, version August 2020

<sup>82</sup> Here and in following: European Commission, Factsheet on 2014-2020 Rural Development Programme for Austria, version August 2020

landscapes. Austria encourages the further development of organic farming practices and aims to improve biodiversity, water and soil management by change to more climate-friendly agricultural practices.

The following chart shows in detail the priorities and measures of the Austrian RDP 2014-2020.

Priority	P1 Knowledge transfer & innovation			P2 Competitiveness		P3 Food chain & risk management		P4 Ecosystems management		P5 Resource efficiency & climate					P6 Social Inclusion & local development			Total	Planned expenditure (million EUR)	
Focus Area	1A - Innovation & cooperation	1B - Links with research & innovation	1C - Lifelong learning & vocational training	2A - Farm's performance, restructuring & modernisation	2B - Entry of skilled/younger farmers	3A - Agri-food chain integration & quality	3B - Risk prevention & management	4A - Biodiversity's restoration, preservation & enhancement	4B - Water management	4C - Soil erosion & soil management	5A - Water use efficiency	5B - Energy use efficiency	5C - Renewable sources & waste management	5D - Greenhouse gases & ammonia emissions	5E - Carbon conservation & sequestration	6A - Diversification & job creation	6B - Local development	6C - ICT - information & communication technologies	Total	Planned expenditure (million EUR)
M01 - Knowledge transfer & information actions				24%	7%	17%	1%		34%		0.5%	2%	1%	0.5%	0.5%	12%		0.5%	100%	115.5
M02 - Advisory services				34%	3%	5%	1%		19%		1%	5%	7%	2%	3%	21%			100%	21.8
M03 - Quality schemes						100%													100%	133
M04 - Investments in physical assets				82%		11%		2%		1%		4%							100%	884.6
M05 - Damage/restoration /prevention actions																				
M06 - Farm & business development					51%								19%			31%			100%	176.1
M07 - Basic services & village renewal								23%					15%				55%	7%	100%	753.4
M08 - Investments in forest areas								78%					22%						100%	127.1
M09 - Producers groups & organisations																				
M10 - Agri-environment-climate								99%						1%					100%	2238.7
M11 - Organic farming								100%											100%	784.6
M12 - Natura 2000 & WFD								100%											100%	3.5
M13 - Areas with constraints								100%											100%	1794.1
M14 - Animal welfare						100%													100%	210.0
M15 - Forest-environmental-climate								100%											100%	7.0
M16 - Cooperation				8%	0.4%	21%	0.4%	20%		0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	47%	0.4%		100%	85.0
M17 - Risk management																				
M18 - Complementary payments to Croatia																				
M19 - LEADER/CLLD																100%			100%	246.2

Figure 22: AUSTRIA - Overview of priorities and measures of the Austrian RDP 2014-2020<sup>83</sup>

<sup>83</sup> The European Network for Rural Development: Rural Development Programme 2014-2020: Key facts & figures AUSTRIA, 2015

## **BULGARIA**

Bulgaria benefits from EU support and funding for the agricultural sector since 2001 when the first pre-accession programme SAPARD started, followed by the Rural Development Programme 2007 – 2013 (RDP), which invested 3.1 billion EUR in Bulgarian agriculture. The existing RDP 2014 – 2020 which effectively started interventions in 2015, has a budget of EUR 3.06 bln., of which 2.5 bln. come from the European Rural Development Fund. However, as at the end of 2020, only EUR 48,3 mln have been effectively paid to the sector for various projects and investments (a total of EUR 302 mln. have been contracted). Nevertheless, the impact of the present and previous funding programmes for the Bulgarian agriculture is enormous. EU aid is extended annually with another EUR 25 mln. national funds designated for the farmers and agricultural producers and EUR 767 mln. direct subsidies.

The investment measures which have the greatest direct effect on the agri-food companies in Bulgaria are part of the RDP still in implementation and these are:

- M4 Investments in Long term assets with a total budget of EUR 341.7 mln.
- M6 Development of farms and enterprises with a total budget of EUR 119.6 mln.

Of these, the most important sub-measures which are focused at direct subsidies for facilities and equipment for the farms and food-processing companies are:

- M4.1 Investments in farms: among others, the following type of costs were reimbursed for the farmers: acquisition/building/renovation of buildings used for the activities of the farm (incl. storage facilities, etc); purchase and installation of new machines, facilities and equipment, incl. agricultural machines, transport equipment.

The maximum amount of grant that one farmer can receive during the period in which RDP is active is EUR 1 500 000 to the maximum of 70% of the total project costs.

- M 4.2 Investment for processing and supply to the market and/or development of agricultural products: targeted to food-processing companies for: acquisition/building/renovation of buildings for the production and marketing, storage facilities, processing, equipment and facilities for packaging, cooling, freezing, drying; buildings and equipment for laboratories, transport vehicles, etc.

The maximum amount of grant that one farmer can receive during the period in which RDP is active is EUR 3 000 000 to the maximum of 60% of the total project costs.

By the end of 2018 a total of 907 contracts for funding have been concluded within sub-measure 4.1 for the amount of EUR 370.09 mln. and 270 contracts amounting to EUR 174.56 mln. for sub-measure 4.2 respectively.

## **CROATIA**

The Croatian Rural Development Programme (RDP) was formally adopted by the European Commission on 22 May 2015, outlining Croatia's priorities for using € 2.3 billion of public money that is available for the period 2014-2020 (€ 2 billion from the EU budget and € 0.3 billion of national funding).

The main objective of the RDP is to restructure and modernize the farm and food sectors. It is expected that nearly 2 000 holdings will receive investment support, more than 5 000 farmers will receive start up aid for the development of small farms and around 1 000 young farmers will get support to launch their businesses. The programme also puts emphasis on the restoration, preservation and enhancement of biodiversity.

There will be support for the conversion to, and maintenance of, organic farming on nearly 60 000 ha. Agri-environment-climate measures will be implemented on a further 40 500 ha. More than one tenth of the funds will be earmarked for energy production from renewable resources. Around 42 000 people will be trained to increase the knowledge and skills of those working in farming and forestry.

Croatia will also implement the European Innovation Partnership. The programme aims to create more than 2 000 non-agricultural jobs through a process of diversification and development of small enterprises. 30% of the rural population will benefit from improved infrastructure.

Support for Rural Development is the second pillar of the Common Agricultural Policy, providing Member States with an envelope of EU funding to manage nationally or regionally under multi-annual, co-funded programmes. In total, 118 programmes are foreseen in all 28 Member States. The new RD Regulation for the 2014-2020 period addresses six economic environmental and social priorities, and programmes contain clear targets setting out what is to be achieved. Moreover, in order to coordinate actions better and maximize synergies with the other European Structural & Investment Funds (ESIF), a Partnership Agreement has been agreed with each Member State highlighting its broad strategy for EU-funded structural investment.

In addressing these challenges, the Croatian RDP will fund actions under all six Rural Development priorities – with the main priority being Priority 2: Enhancing farm viability and competitiveness of all types of agriculture in all regions and promoting innovative farm technologies and the sustainable management of forests.

## **REPUBLIC OF MOLDOVA**

UE supports the development and modernization of agriculture in the Republic of Moldova through various instruments aimed at implementing the association agreement.

The most successful programs include the „European Neighborhood Program for Agriculture and Rural Development” (ENPARD). Within the framework of the program, for the period 2016-2019, budgetary support to the agricultural sector was carried out in the amount of 53 million euros.

The program will contribute to:

- Developing the export capacities of the main products on the EU market and, consequently, increasing the impact on GDP;
- Restructuring and modernization of the agri-food sector;
- Ensuring the sustainable management of natural resources;
- Improving living and working conditions in rural areas;

- Transposition of the standards and requirements of quality, safety and control of the European Union;
- Increasing the competitiveness of agri-food production, by investing in the modernization of the agri-food and feed chain;
- Development of education, research and extension services in the agri-food sector, including facilitating the development of information systems;
- Reducing agricultural regions affected by natural disasters and reducing the effects of climate change;
- Facilitating investments in physical infrastructure and rural services.

## **REPUBLIC OF SERBIA**

### ***IPARD II program 2014-2020***

The Republic of Serbia is a country in the process of joining the EU. Ministry of Agriculture and Environmental Protection Republic of Serbia started the process of drafting the IPARD II program of the Republic of Serbia at the beginning of 2014. The work on the development of the program was based on the defined guidelines and analyzes obtained through the process of drafting the National Strategy for Agriculture and Rural Development 2014-2024. years.

The IPARD II PROGRAM of the European Union is the Instrument for pre-accession assistance in the field of rural development for the programming period 2014 to 2020 - achieving European standards and raising competitiveness. The program was approved by both the EU and the Republic of Serbia. The donation program is implemented through the Ministry of Agriculture and Environmental Protection, Directorate for Agrarian Payments ([www.uap.gov.rs](http://www.uap.gov.rs)). Competitions for donations are announced once a year. The total budget is 229,970,558 Eur.<sup>84</sup>

The following donation calls are current:

- MEASURE 1: Investments in physical assets of agricultural holdings. The total budget is 101,386,667 Eur.
- MEASURE 3: Investments in physical assets related to the processing and sale of agricultural and fishery products. The total budget is 82,946,667 Eur.
- MEASURE 7: Diversification of agricultural holdings and business development. The total budget is 23,333,333 Eur.

The amount of grants is defined for each measure separately and according to additional criteria, and it ranges from 50-70% of the value of the investment.

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<sup>84</sup><https://ipard.co.rs/>



### ***IPARD 3 program 2021-2027***

A draft for the IPARD 3 program for incentives for investments in rural development is being prepared, and its accreditation and adoption is expected in the fall of this year, while the first public calls under this program are expected in early 2022.

New measures are expected that will enable the financing of a wider range of investments.

## **SLOVAKIA**

State administration and state professional supervision in the field of agriculture and rural development, is managed by the Ministry of Agriculture and Rural Development of the Slovak Republic. Ministry in accordance with the Action Plan for the Development of Agriculture in the Slovak Republic for the years 2014 - 2020 and through the National Agricultural and Food Center (NPPC)

The 2014-2020 programming period is being implemented in accordance with the approved CAP reform. EU rural development policy as II. The CAP pillar is constantly evolving with a view to responding to new challenges in rural areas and accelerating the integration of environmental requirements.

In 2020, the “Green Diesel” project - state aid for the provision of relief in the form of environmental reductions taxes, the aim of which is to maintain primary production in Slovakia, reduce exports of key commodities and thus reduce or. stagnation of the negative foreign trade balance. Support for primary production can help reduce exports of key commodities in connection with the strengthening of their domestic processing and the subsequent sale of domestic products with a positive impact on employment. The amount of state aid is based on the norms of diesel consumption, ie operating indicators of machine deployment and cost indicators. In crop production, support is focused on the cultivation of fruits, vegetables, ware potatoes, legumes, sugar beets, soybeans, poppies, flax, hemp, hops, spices and medicinal plants.

## **HUNGARY**

### ***National Rural Strategy 2012-2020:***

Its aim is to reverse the unfavorable processes prevailing in most of the rural areas of Hungary in order to determine the objectives and principles of the country’s rural policy and the implementation framework of the programs and measures ensuring their achievement, based on a vision focusing on sustainability, viable agricultural and food production and rural life. It sets out actions for the agri-food economy and rural development based on the sustainable use of natural resources. Its main areas are employment growth, balanced and diversified agriculture and forestry, production structure, restoration of local food production and markets, local energy production, strengthening of local communities in the countryside, improvement of population indicators and preservation of natural systems and biodiversity.

Objectives:

- Overall objective: To improve the population retaining ability and the ability to economically provide for a population of our rural areas
- Horizontal aspects: sustainability, territorial and social cohesion, urban-rural relations
- Strategic goals:
  - Preservation of the natural assets and resources of our landscapes
  - Diverse and viable agricultural production
  - Food security
  - Ensuring the viability of the rural economy, increasing rural employment
  - Strengthening rural communities, improving the quality of life of the rural population

***Hungary's food economy program 2016-2050:***

The program is a long-term concept that defines the vision, priorities, intervention directions, risks and key tools for the food economy to achieve its goals. The document seeks to go beyond the usual seven-year planning periods within the European Union and to set objectives and directions for action for the next thirty-five years in order for the Hungarian food economy to be able to respond to the challenges, to be able to manage the expected natural and market risks, and to be able to move on to a higher quality phase.

Quantified goals:

- the gross value added of the food industry should be 2.5 times the gross value added of agriculture
- agricultural exports should reach EUR 20 billion at current prices.

***Logistics:***

Despite our opportunities, Hungary is still in one of the last places within the EU in terms of foreign trade logistics efficiency. An important factor in this is that we currently generate almost 80% of export revenue through road transport.

The economical export of Hungarian cereals requires the development of railway transport systems (loading and transport capacities) and the organization of transport (direct trains, return transport). The Tisza and the Danube should be better exploited as waterways to the Black Sea.

## **5.2 Overview of measures taken to increase agricultural trade and required infrastructure**

The analysis has focussed on the bordering areas of the Danube in terms of known strategies / plans / projects / measures to support development (EU/national funding) of road infrastructure going to naval terminals, development of new naval terminals, storage capacities with ship loading facilities etc. The existing Danube ports and terminals that have facilities for the transport of agricultural products will be listed. As far as possible, the large grain silos that are operational and located on the Danube or in the adjacent area will be listed.

### **AUSTRIA**

According to the stakeholder interviews lead for the DT 3.2.1, the measures taken to increase agricultural trade and the required Danube infrastructure can be summarised as follows:

- pursue the digitalization of IWT management;
- develop transshipment facilities for combined transport and railway connections designed to support the modal shift of freight from road to rail and water;
- extend the trimodal logistics (warehousing);
- improve loading/ unloading facilities where necessary;
- improve waterway maintenance;
- equip ports to withstand climate change effects (e.g. flood and low water periods)
- develop cost-saving infrastructure and pass along cost savings to customers;
- secure tax and promotional benefits;
- develop measures and activities to discourage road freight transport.

In this regards, main transport development plans and strategies in Austria are:

#### **Austrian Transport Policy / Mobility Master Plan 2030**

The Austrian Mobility Master Plan 2030 was developed by the Austrian transport sector and is based on an integrated strategy for passengers, freight and individual transport. The plan includes concrete measures for IWT, rail, road and air transport as well as for creating optimal framework conditions.

#### **Innovation aid programme for combined transport**

The programme supports the development of the combined transport (modal shift towards environmentally friendly modes of transport); project size EUR 8.000 - 800.000, grant 30% for investments, 50% for feasibility studies.

#### **National Action Programme Danube 2022**

The programme supports navigation, environment and flood protection for the Austrian Danube until 2022. Future topics with IWT-connections are greening of ports, infrastructure for alternative sustainable fuels as well as automatization and digitalisation.

### **Programme supporting the development of connecting railway and transfer terminals in intermodal transport 2018-2022 (SA. 48485)**

Development of transshipment facilities for combined transport and private railway connections designed to support the modal shift of freight from road to rail and water. The programme supports the Aid for investments for the construction and the extension of infrastructure for combinations of land-/water-bound modes of transport, in which cargo is handled either containerised or as piece/bulk freight. Subsidy level up to 50% of eligible expenditure

#### **Klimaaktiv mobil**

The purpose of this funding is to achieve environmental effects such as reduction of greenhouse gases (CO<sub>2</sub>-, NO<sub>x</sub>- emissions and dust) through transport and mobility measures or to foster active climate protection in the transport sector. Grant size: up to 50% of investment cost.

#### **National environmental Aid scheme**

The programme supports company-related traffic measures to reduce air pollution, climate-relevant pollutants, noise and waste; Actions to be supported are not strictly defined; Subsidy level: with EU co-financing up to 35%, without EU co-financing up to 30%.

#### **Logistikförderung 2019 – 2023 (Innovative logistics)**

The Federal Ministry Republic of Austria, Climate Action, Environment, Energy, Mobility, Innovation and Technology supports the development and implementation of innovative logistics concepts under the participation of the public sector for the enhancement of the competitiveness of the logistics sector and the attractiveness of locations as well as for the securing of social and ecologic sustainability. Grants for feasibility studies and investment projects, subsidy level: up to 70% for feasibility studies, up to 50% for investment projects; project size: EUR 10.000 – 300.000.

## **BULGARIA**

The analyses show that in Bulgaria there are not enough connections of the national railway network with the sea and inland waterway ports.

It is important to build the northern Danube road Vidin - Lom - Svishtov - Ruse - Silistra, which will improve transport accessibility to the coastal industrial zones and will therefore increase the investors' interest in them. Currently, the connection of most Danube ports with the main roads of the country is done via second-class roads, most of which are in bad condition.

At the time of the elaboration of current report, MTITC has assigned the preparation of a draft National Plan for the Development of Combined Transport in the Republic of Bulgaria until 2030." It sets 3 groups of measures: 1 - organizational and administrative issues; 2 - operational issues and service support; 3 - infrastructure improvement, incl. equipment of the terminals.

According to the preliminary information available, some of the planned measures set in group 3 are:

1. Construction of an intermodal terminal in Northern Bulgaria, including:

- Construction of the supply leading infrastructure - railway and road;
- Construction of infrastructure within the selected site - track development, main and auxiliary buildings and offices;
- Equipment of the site with the necessary facilities, incl. equipment for reloading - cranes - rail and mobile; shunting locomotives, wagons, containers; access systems, logistics, communications, security, etc.
- Implementation of an information system for cargo handling.

2. Complete preparation for modernization / development of existing terminals in the Republic of Bulgaria:

The measure will cover activities in the following terminals, which have the necessary mechanization and process intermodal transport units - Burgas West, Port Bulgaria West, Burgas (Dolno Ezerovo), Varna West, Lesport, Ruse East, Svishtov - cargo, Lom, Vidin, Voluyak, Stara Zagora, Dimitrovgrad and Intermodal Terminal Plovdiv.

3. Improving the railway infrastructure leading to port, railway terminals and logistics centers:

The measure will cover activities for repair, maintenance and, if necessary, modernization / development of the railway infrastructure leading to port and railway terminals and logistics centers in the Republic of Bulgaria.

4. Study of the possibilities for construction of an intermodal terminal in the region of Vidin.

The existing Bulgarian Danube ports and terminals that have facilities for the handling, storage and transport of agricultural products are listed below:

**Port of Vidin**

There is a railway connection only in Vidin-north terminal, and this is the trimodal point for the area. Only Vidin-north terminal works, but with very reduced volumes, most probably because cargo is passing through the Danube Bridge 2. Main cargo groups are grain for export, fertilizers, coal.

**Port terminal Lom** (part of Public transport port of national importance Lom)

Main port users are forwarding and industrial companies that import or export production and materials, etc. Users are importers of metal products and fertilizers, companies exporting grain and importers of coal for domestic and industrial use.

**Port terminal Oryahovo** (part of Public transport port of national importance Lom)

Port of Oryahovo with private operator working in the field of agricultural production and commerce – handles predominantly grain for export and import of fertilizers.

**Port of Ruse**

Terminals in the scope of Port of Ruse have the following characteristics:

- Ruse-east: main cargo types – grain, coal, wooden material, chemicals, machinery and equipment, metal products, etc. From 2014 there is regular transshipment of 123 intermodal units – containers and trailers – from railway transport. In 2017 this activity decreased.

Ruse-east has the biggest potential for future development of new terminals, quays, basins, storage areas etc.

On the Ro-Ro terminal, located in Ruse-east, there are two parking areas with capacity of 160 TIR. Now, due to low activity of the ro-ro, parking areas are used as a storage for agricultural and other machinery and equipment.

- Ruse-west: the terminal handles grain, chemicals, metal products, etc.

**Port terminal Svishtov** (part of Public transport port of national importance Ruse)

The terminal handles grain.

**Port terminal Somovit** (part of Public transport port of national importance Ruse)

Basic cargo types – grain and fertilizers.

**FT Nikopol** (part of Public transport port of national importance Ruse)

In operation since 2010. Serves the ro-ro line Nikopol – Turnu Magurele. The private concessionaire handles grain for export with the help of mobile equipment.

**Port YGY Silistra**

First May JSC is a leading company in agricultural production and processing of grains and seeds in Bulgaria. The company owns and operates a YGY river port on Danube river and Cargo Airport in the region. The port has 10 silo cells, a flow loader for ships (barges), two truck scales, a grain dryer, a grain cleaning machine, a laboratory. The investment project of the port has an investment certificate, class "A".

**Port „Merlin“ Silistra (former ADM Silistra)**

The first private grain port is built in the village of Aydemir, 6 km west of Silistra. The company acquired the port in 2019, but it was built in 2017. The American company ADM built it based on their own plans. At the moment, the port has 10 silo cells, two auto scales, grain dryer, grain-cleaning machines, a laboratory. Its capacity is 20 000 tons. There are two quay stands. There is a railway connection to the port, but it has not been active for many years. There is no railway trading activity in Silistra at all.

## **CROATIA**

**Port of Vukovar**

The analysis of transport infrastructure refers to road, rail and river transport and infrastructure for performing public transport utility activities in Vukovar-Srijem County. The potential of the County as a transport and logistics centres is still unquestioned. European transport corridors pass through



the area of the county, the corridor VII (Danube) and Corridor X (Salzburg - Thessaloniki, with the section Zagreb passing through Croatia - Bajakovo). While road corridor X is in very good condition, rail is needed further improvement before its quality is at the level of European standards.

Road infrastructure was mostly developed until the Homeland War, when Vukovar-Srijem County was an important transport and logistics center. The county area has four exits of the A3 motorway (Babina Greda, Županja, Vrbanja, Lipovac). Cities (Ilok, Otok, Vinkovci, Vukovar and Županja) are interconnected by state roads, and other populated places within the county by local and county roads and state roads. Due to the relocation of heavy freight traffic, faster flow of vehicles in transit and increase in traffic safety, bypasses are needed around the towns of Vinkovci, Vukovar and Ilok (e.g., corridor of the state road D2 passes through the center of the city of Vukovar). They are currently being prepared, as well bypass construction projects have started, and some sections have already been built and are in operation in public road networks.

Corridor X has well-built highways. In addition, connections to the corridor X are well-built federal roads, so along Corridor X one can speak of good transport network. Corridor Vc is also a motorway, so a high standard is ensured here as well as quality. The Port of Vukovar is located near the intersection of Corridor X and Corridor Vc and thus benefits from well-built road infrastructure.

Vukovar Port is the biggest river port on Croatian waterways and only cargo port on Croatian part of Danube River. The port stretches towards the East and West and it is 1700 meters long and 45 meters wide. The port is very well situated on the Danube which makes it possible for the port to be accessible during the entire year regardless of the water level. This includes docking even during the period of the lowest water levels. The entire port was destroyed during the Homeland war. The port was not operational between 1991-1997. It was opened again in 1998.

Port of Vukovar is connected to the cities of Županja, Vinkovci and Brčko (Bosnia and Herzegovina) via M55 road. The same road connects it to the highway E-75 connecting Zagreb and Belgrade (Republic of Serbia). It is also connected with road M2 with city of Osijek and with corridor VC (Budapest-Osijek-Sarajevo-Ploče). The port is located on Danube River that is Pan European corridor VII and it is part of the Rhine-Danube Core Network Corridor.

The railway infrastructure modernization and electrification project are in progress and it will reduce the existing port area for approximately 5,8 ha. Port of Vukovar is an open shore type port with no port basins. It has a maximum draft of 2,6 meters and a cargo handling capacity of 2 million tons per year. There are no capacities for container handling in the port at this moment. There are capacities for high and heavy and out-of-gauge cargoes.

There are 7 terminals in the port which all have access to road, rail and IWW:

- Bulk cargo terminal,
- Grain's terminal
- Break bulk (general) cargo terminal
- Two liquid cargo terminals
- Multipurpose cargo terminal
- Palletized cargo terminal.

Port has 3 road entrances with 6 lanes. Total length of quay side railway track is 800 m, total length of the railway tracks is 3000 m.

Capacity of the storage is 13000 m<sup>2</sup> for dry bulk and general cargo and 10000 m<sup>3</sup> for liquid cargo. Bunker supply is provided in the bunker area. The port has facilities for ship generated waste as well as for the used oil but this equipment is not in operation at the moment.

## **REPUBLIC OF MOLDOVA**

A key factor underlying the low competitiveness of the agri-food sector is the decline of the food processing industry. The processing industry contributes to the increase in the added value of agricultural products. This increase, in the case of the Republic of Moldova, is also hindered by the lack of investment in the agri-food processing sector. Agricultural product processing companies face serious constraints in many areas, including technologies, equipment, finance, management, marketing, logistics, the burden of regulation.

Currently, the storage capacity of grain silos is a modest one.

There is a drastic problem with strategic policy documents, including development programmes in the Republic of Moldova, given that the National Development Strategy "Moldova 2030" has not been approved yet, which is in the process of public consultations, on the one hand, and the National Strategy for Agricultural and Rural Development 2021-2030, which is being developed. In this situation, the information cannot be provided for the analysis of long-term development programmes.

The only action targeting the Giurgiulesti Port Complex provided for the Transport and Logistics Strategy for the years 2013 - 2022, approved by Government Decision No. 827/2013, it should be provided with port facilities to receive waste from its operation on board ships.

## REPUBLIC OF SERBIA

### Existing ports in the Republic of Serbia

The existing Danube ports and terminals that have facilities for the transport of agricultural products are as follows:

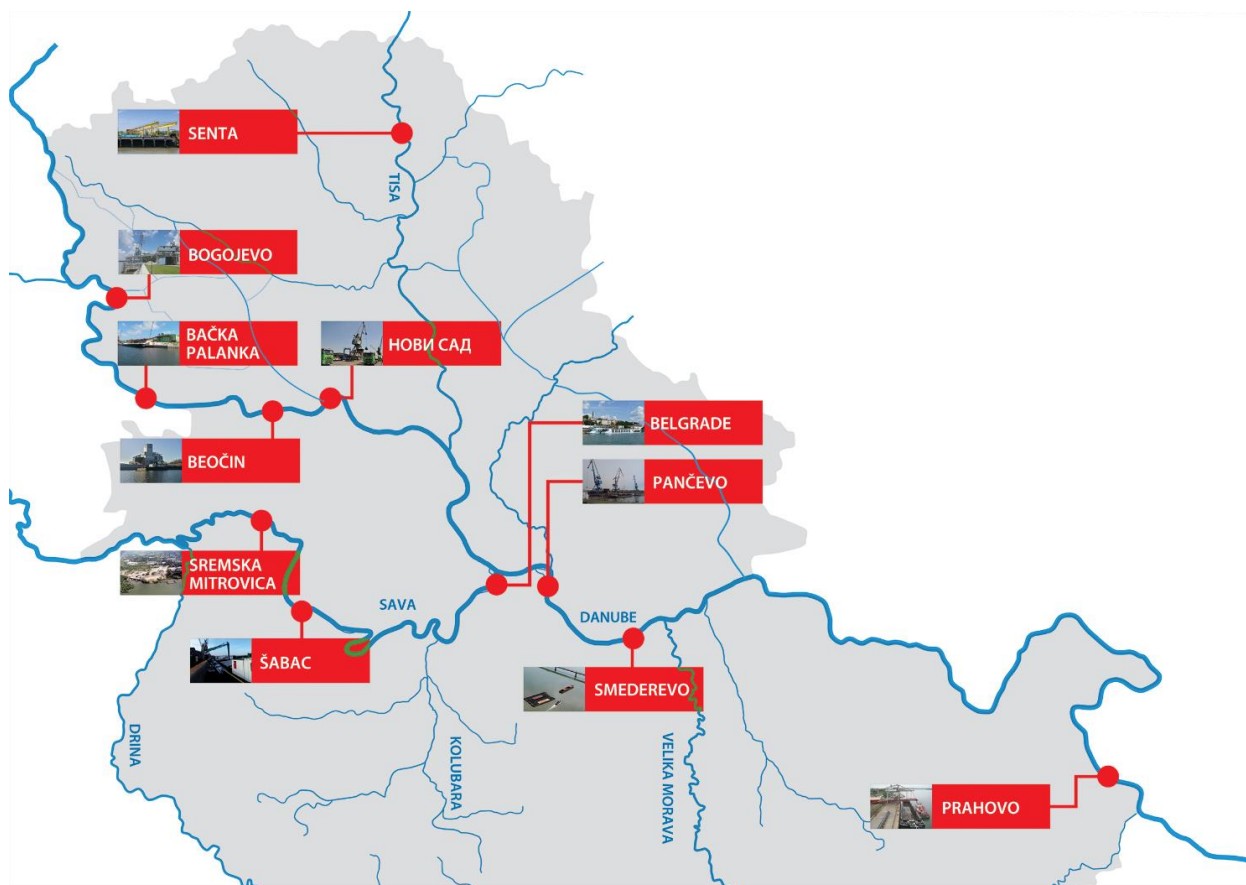


Figure 23: REPUBLIC OF SERBIA - Inland Waterways and ports

In the Republic of Serbia there are 11 ports, 7 on Danube river: Bogojevo, Bačka Palanka, Beočin, Novi Sad, Pančevo, Belgrade, Smederevo and Prahovo, 2 on Sava river Šabac and Sremska Mitrovica and 1 on Tisa river - Senta.

Agriculture is a priority sector in Vojvodina. Traditionally, it has always been a significant part of the local economy and a generator of positive results, due to the abundance of fertile agricultural land which makes up 84% of its territory.

Majority of ports in Serbia are located in Vojvodina, on Danube river: Bogojevo, Bačka Palanka, Beočin, Novi Sad, Pančevo, on Sava river Sremska Mitrovica and Senta on Tisa river. Vojvodina province is characterised by arable land of good quality, overall economic and cultural development, great population density and demographic diversity.

In the cargo structure, bulk cargo dominates over general cargo, which is almost negligible. Agricultural products in bulk, as well as different fertilisers in bulk, represent the majority of cargo

transhipped in ports in Vojvodina. The most commonly handled cargoes are grains, fertilizer components, scrap iron, ferrous metal products etc.

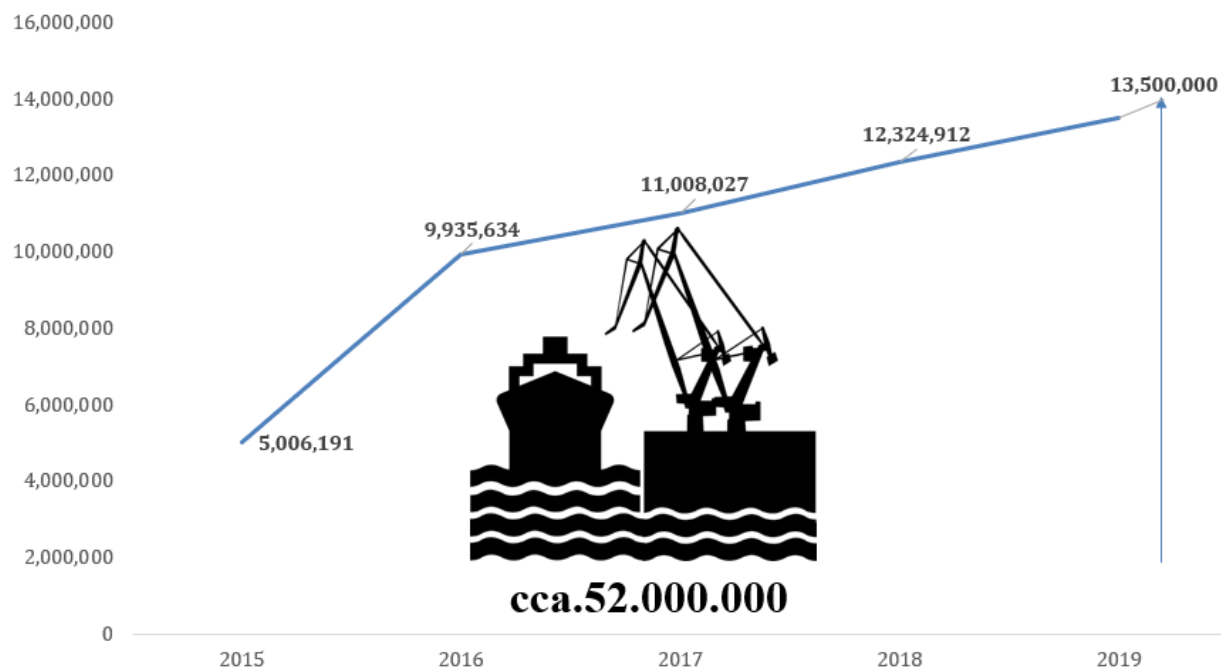


Figure 24. REPUBLIC OF SERBIA - Quantities of cargo transhipped at all Serbian ports

The share of cereals in the total volume of cargo transshipment in 2019 is 15.15%, and oilseeds 0.09%.

### Agricultural products in Serbian ports

Serbian ports in which agricultural products are dominantly transshipped are: Pančevo (operators: Luka „Dunav“ ad Pančevo, Granexport Ltd and Specijalna luka Ltd.), Bogojevo (operator Luka Dunav Bogojevo Ltd), Novi Sad (DP World Ltd Novi Sad) and Bačka Palanka (Luka Bačka Palanka). The most common agricultural products are cereals: wheat, corn, barley and oilseeds: sunflower, soybean, sugar beet and rapeseed. The total reloaded of agricultural products in Serbian Ports range from 1,940,630 tonnes in 2016 to a record 2,823,079 tonnes in 2020.

Serbian ports in which agricultural products are dominantly transshipped are: Pančevo (operators: Luka „Dunav“ ad Pančevo, Granexport Ltd and Specijalna luka Ltd), Bogojevo (operator Luka Dunav Bogojevo Ltd), Novi Sad (DP World Ltd Novi Sad) and Bačka Palanka (Luka Bačka Palanka) and this four ports were analysed. The most common agricultural products are cereals: wheat, corn, barley and oilseeds: sunflower, soybean, sugar beet and rapeseed.

**Port of Novi Sad** is in the central part of Vojvodina, the northern province of the Republic of Serbia. It lies within the City of Novi Sad at the 1,254-kilometre point of the left bank of the River Danube. Port area approximately 115 ha. In port of Novi Sad there are two port operators: DP World Novi Sad and NIS ad Novi Sad. On this location at the intersection of river Corridor VII and land Corridor X makes this a hub for international communications and transport. The strength of the port’s location is not only geographical: it also has excellent transport connections, just 0.3 km away from Rail Corridor X and 3 km away from Road Corridor X. The strength of the port’s location is not only

geographical: it also has excellent transport connections, just 0.3 km away from Rail Corridor X and 3 km away from Road Corridor X. Most of agricultural products were transhipped in the port of Novi Sad.

**Port of Pančevo** is located on the left bank of the Danube, at km 1,153. Total port area is 1,270,296 m<sup>2</sup>, it has an open and covered storage area, storage for dangerous cargo and customs warehouse. The port is equipped a conveyor belt, pneumatic equipment and a Ro/Ro-ramp, and it handles dry bulk, break-bulk, container cargo, high & heavy cargo, petroleum products, liquid bulk and crude oil. In the port of Pančevo there is a possibility of loading / unloading agricultural products in a container with a limit of carrying capacity of handling machinery (cranes) of 27t.

**Port of Bogojevo** is located on the left bank of the Danube, at km 1,366. Total port area is 150,000 m<sup>2</sup>, it has a covered storage area, and is equipped with a gantry crane, that has a max. lifting capacity of 20 tones, and a conveyor belt. The port handles dry bulk and break-bulk cargo. The Ministry of Construction, Transport and Infrastructure of the Republic of Serbia has awarded contracts for the preparation of technical documentation for the expansion of the port of Bogojevo, which will make the port eligible for inclusion in the Core TEN-T river port network.

**Port of Backa Palanka** is located on the left bank of the Danube, at km 1,295. Total port area is 640,000 m<sup>2</sup>, it has an open and covered storage area, it is equipped with a gantry crane, that has a max. lifting capacity of 12-tons, a mobile crane with a 9-tone capacity, a floating crane with a 6-tone capacity, a conveyor belt, pneumatic equipment and a Ro/Ro-ramp. The port handles dry bulk and break bulk cargo.

## SLOVAKIA

Logistic hubs and multimodal terminals are described in Country reports T1.1.2 Transport Infrastructure Status Quo and T3.2.1 Analysis of status-quo and mid-term perspective of transport infrastructure (IWT/rail/road) elaborated under DIONYSUS project. Storage and transshipment capacities of Slovak ports are exhausted only partially, the need for expansion of capacities has not been identified. In term of transportation of agricultural production, the rail transport is preferred. Reasons for this are following:

- International trade of agricultural production is performed mostly on relative short distances between neighboring countries. Waterway transport therefore is not financially profitable.
- Some products are fragile (barley requires clean environment; artificial fertilizers are hydrophobic)
- Supply chain for some product require on-time approach.

On the Slovak section of Danube there are two TEN-T Core Network ports, equipped for reshipment of agricultural production, port of Bratislava and port of Komárno.

**Port of Bratislava** is the most important port of Slovakia, located on left bank of Danube between Km 1871 and Km 1862, with an area of 1,431,586 m<sup>2</sup>. The port has sheltered storing surfaces of 25,000 m<sup>2</sup> and unsheltered storing surfaces of 75,000 m<sup>2</sup> and a container terminal with an area of 15,000 m<sup>2</sup> but limited in expansion due geographical terms.

Accessibility of ports from the TEN-T network:

TEN-T Core Network Corridors:

- Baltic – Adriatic CNC
  - Rail: Bratislava UNS Terminal (5km) – direct railway connection
  - Road: motorway D1 (1km)
- Orient / East Med CNC
  - Rail: Bratislava UNS Terminal (5km) – direct railway connection
  - Road: motorway E65 / D4 (13 km)
- Rhine – Danube CNC
  - Rail: Bratislava UNS Terminal (5km) – direct railway connection
  - Road: motorway E58 / D4 (19 km)
  - IWT: direct access

Access points to TEN-T network are in the direct vicinity of the ports. No major infrastructure projects are currently in progress.

**Port of Komárno** is located on the left bank of Danube between Km 1770 and Km 1762, at the end of confluence with the Váh river, covering an area of 20 hectares. Komarno is a public port built for bulk materials transshipment having 26,000 m<sup>2</sup> of unsheltered storage, 6,600 m<sup>2</sup> sheltered storage and a warehouse of 1700 m<sup>2</sup>.

Accessibility of ports from the TEN-T network:

TEN-T Core Network Corridors:

- Baltic – Adriatic CNC
  - Rail: Bratislava UNS Terminal (100 km)
  - Road: motorway E60, M15 (HU) (120km)
- Orient / East Med CNC
  - Rail: Komárom railway station (up 20km)
  - Road: road 13-as főút direction Csém (HU) (11 km)
- Rhine – Danube CNC
  - Rail: Komárom railway station (up 20km)
  - Road: road 64 (3,5 km)
  - IWT: direct access



Port has direct access to the Danube river and near access point to the Orient / East Med CNC. No infrastructural projects are currently in progress.

TEN-T core network ports	Production		
	Agricultural products	Others	Containers yes/no
<b>Bratislava</b>	Corn, Sunflower, Wheat, Soy, Barley, Oilseed rape	fertilizers, iron ore, mineral oils, heavy goods, piece goods,	yes
<b>Komárno</b>	Corn, Sunflower, Wheat, Barley, Oilseed rape	mineral oils, gravel, sand	no

Table 23: SLOVAKIA - categories of agricultural goods transhipped in Slovak TEN-T ports

#### **Priemyselný park Štúrovo a.s.<sup>85</sup>**

The park has all the necessary equipment and professional staff for fast and efficient transhipment of various goods between rail, road and water transport. The total usable length of the port is 200 meters, with the possibility of extension up to 1 km. The port is connected to the railway network of the industrial park.

#### **Multimodal terminal Metrans Dunajská Streda<sup>86</sup>**

Terminal is located in South-West part of Slovakia, almost in the middle between Bratislava and Komárno. It is part of METRANS network and provides bimodal transhipment (rail/road). This terminal provides connection to Xi'an (PRC).

## **HUNGARY**

A significant part of the turnover of the Danube ports in Hungary is the loading of cereals, between which we distinguish National Public Ports and public ports. Official statistics on the types of goods loaded in ports are not published by the KSH (Hungarian Central Statistical Office).

**Győr-Gönyű National Public Port:** Types of goods loaded: cereal crops, fertilizer, maize oil, linseed oil.

<sup>85</sup> <https://ppsturovo.sk/en/transhipment-of-cereals/>

<sup>86</sup> <https://metrans.eu/solutions/mettrans-terminal-deport-solutions/hub-dunajska-streda-sk/>

#### Loaders, Equipment for Cargo Loading and Bagging:

- 3 pcs of heavy-duty mobile bucket loader – with a loading capacity of 150-200 tonnes/hour/machine
- 4 pieces of compact loaders – crop bucket, pallet forks
- 2 pcs of forklift truck with a load bearing capacity of 3 tonnes
- 2 pcs of loader with telescopic beam
- 3 pcs of crop chute
- 2 pcs of bridge scale with a load-bearing capacity of 60 tonnes, and an axle weight meter
- harbour mobile crane – with a load bearing capacity of 45 tonnes
- mobile truck crane – with a load bearing capacity of 150 tonnes (300 tonnes in certain cases)
- RO-RO ramp – with a slope of 11%, width of 25 m and load bearing capacity of 65 tonnes
- floating machine for the loading of liquid and hazardous cargo – with a loading capacity of 200 m<sup>3</sup>/hour
- bagging and foiling equipment

#### Tools of roofed storage in closed spaces:

- 2 pcs of crop warehouse (10 pieces of storage cell) with a closed storage system – on a basic area of 6,200 m<sup>2</sup>, with a storage capacity of ca. 10,000 tonnes – with storage and issue capacities of 100-150 tonnes/hour
- 4 pcs of silo container each with a capacity of 250 m<sup>3</sup>, with a storage and issue system - with a storage capacity of ca. 1000 tonnes – with a storage and issue capacity of 100 tonnes/hour
- 2 pcs of forklift truck with a load bearing capacity of 3 tonnes
- 4 pieces of compact loaders – crop bucket, pallet forks
- 2 pcs of loader with telescopic beam

#### Outdoor Storage

Outdoor storage of piece goods, containers, heavy and/or oversized cargo and other loads in the harbour area. 68,000 m<sup>2</sup> closed storage area (including 43,000 m<sup>2</sup> of paved area and 25,000 m<sup>2</sup> of gravel bedded area for storage), space monitoring system, 24-hour security and monitoring guard.

**Budapest-Csepel National Public Port:** Types of goods loaded in bulk: barley, wheat, maize, sunflower, rapeseed, soybean, fertilizer.

There is a possibility for cleaning the cereals. The covered storage capacity (101,595 m<sup>2</sup>) is three times bigger than the open one.

Several public and railway infrastructure investments are currently being prepared, which may help the operation of the Freeport of Csepel.

In place of the dilapidated railway bridge leading to the island – Gubacsi railway bridge - a new railway bridge is being designed, which will have a higher load capacity and will be better suited to serve the intermodal nature of the port.

One of the busiest public and railway junctions near the port, the Corvin junction, will also be rebuilt in the coming years, and once the reconstruction is complete, logistics will become smoother for the port as well.

One of the road bridges leading to the island, the Gubacsi road bridge, is in a dilapidated state, so its reconstruction is currently under preparation.

To facilitate the accessibility of Csepel Island, a new Danube Bridge will be built in the coming years, connecting North Csepel and Buda.

**Baja National Public Port:** Types of goods loaded in bulk: wheat, maize, barley, rapeseed, rye, sunflower, soybean, fertilizer. Maximum silo capacity: 55,200 m<sup>3</sup>.

The Port of Baja and Intermodal Logistic Service Centre, one of the most important Hungarian strategic ports, is located on the left bank of the Danube between the river kilometres 1479+140 and 1480+900, which has direct road and rail connection and is available on inland waterway from the North and the Black Sea as well. We pay special attention to environment protection; in our 9 terminals you can find a Ro-Ro service which ensures combined transportation between road and waterway. The port also utilizes a „Green Terminal”, which collects ship borne waste (dead oil, oily and bilge water, oily clothes and filters, storage battery) and gives drinking water and electricity if it is needed. The port offers a whole scale of logistic services for its customers, such as goods- and container handling, loading and unloading, warehousing, storing, customs and financial services, a phytosanitary station, container and ship repairing, forwarding, etc.

The port of Baja currently has 9 terminals, out of which 8 are economic loading bays, and the ninth is a port for the neutralization of environmentally harmful waste and hazardous substances generated by watercrafts. The 8 economic port units are the following: 1 Ro-Ro terminal, 1 heavy lift loader, 1 two-line container loader, 3 grain loaders, 1 wood loading port, 1 gravel-sand bulk cargo. At present, all of our ports are licensed to operate, satisfying the demands of both the authorities and the users. In addition to dealing with pollutants and waste, we can provide water and electricity; there are currently no bunkering facilities. Can provide a full trimodal service of goods, which means that we can reload goods transported by road, rail and water in any ratio and variation.

### **Other Ports:**

Ports suitable only for bulk loading: Adony, Bogyiszló, Fadd-Dombori, Harta, Komárom, Mohács) - typically cereals.

Ports not only suitable for bulk loading: Danube Port Ltd., Dunaújváros, Dunavecse, Paks) - in addition to bulk cargo, general cargo, bagged goods, heavy cargo.

In terms of storage capacity, we see a different picture in each port:

- covered, closed storage capacity is available in 5 ports between 500 m<sup>2</sup> and 13,300 m<sup>2</sup>;
- open storage is also available in 5 ports between 1000 m<sup>2</sup> and 14,600 m<sup>2</sup>;
- dangerous goods storage in the Danube Port is possible on 800 m<sup>2</sup>;
- free port in Adony is available on an area of 16,000m<sup>2</sup>, while
- the silo capacity in 5 ports totals more than 42 thousand cubic meters

SWL 20 - 330 mto lifting capacity is available for heavy cargo handling at Hungarian Danube ports.

### **Mohács:**

Currently, 27,500 m<sup>3</sup> of silo capacity is available.

A complex investment is currently underway in the town, because of which our country will be expanded with another National Public Port from 2023.

Project content:

In the area of the planned port, a vertical port shore wall with a total length of 330 m will be built parallel to the shore. The port shore wall will be connected to the Southern corner of the Schengen port on the upstream side as a separate structure.

In the area of the port, a container crane with a lifting capacity of 40 tonnes will also be built with a crane track. Other smaller loading facilitation investments are also under construction. Owing to these, the area will be suitable for loading larger, bulkier goods, and the port will also be more suitable for adapting to flood situations.

Railway expansion is also planned in the area, making it more suitable for intermodal logistics.

In addition to the investments described above, other additional investments and the necessary public utility investments are also under construction.

### **5.3 Analysis of future development programs**

The analysis has focussed on future Development Programs and strategies (having EU/national funding) aiming: farms development by endowment with tractors and machinery; construction / modernization of grain storage and conditioning capacities (especially those measures allowing building large new storage facilities on Danube); development of road infrastructure in the bordering areas of the Danube; development of terminals for agricultural products.

#### **AUSTRIA**

The CAP transitional regulation 2021-22 extends most of the CAP rules that were in place during the 2014-20 and includes elements of the European Green Deal<sup>87</sup>. Acc. to the transitional regulation, each RDP – including Austria - must work towards at least four of the six priorities of the EAFRD<sup>88</sup>:

1. “fostering knowledge transfer and innovation in agriculture, forestry and rural areas;
2. enhancing the viability and competitiveness of all types of agriculture, and promoting innovative farm technologies and sustainable forest management;
3. promoting food chain organisation, animal welfare and risk management in agriculture;
4. promoting resource efficiency and supporting the shift toward a low-carbon and climate resilient economy in the agriculture, food and forestry sectors;
5. restoring, preserving and enhancing ecosystems related to agriculture and forestry;
6. promoting social inclusion, poverty reduction and economic development in rural areas.”<sup>89</sup>

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<sup>87</sup> [https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/transitional-regulation\\_en](https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/transitional-regulation_en)

<sup>88</sup> [https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/rural-development\\_en](https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/rural-development_en)

## **BULGARIA**

The future (budget period 2020 – 2027) financial support for Bulgaria is still in a preparatory phase as the whole planning process at national at Central European level has been delayed due to the Covid crisis. In 2021, EUR 458 million are planned, which will be directed to the agricultural sector, young farmers and small farms. Some of the most popular measures are expected to be announced for projects' submission:

- 4.1 "Support for investments in Agricultural Holdings";
- 4.2 "Investments in processing / marketing of agricultural products";
- 6.1 "Business start-up aid for young farmers";
- 6.3 "Business start-up aid for the development of small farms".

In the coming years, special attention will be paid to the so-called "sensitive sectors": organic production, animal husbandry, fruit growing. Investments related to digitalization, work process automation, irrigation and environmental protection will be supported.

### **Strategic Plan for the Development of Agriculture and Rural Areas for the Programming Period 2021-2027**

Bulgaria is working very intensively on the preparation Strategic Plan for Agriculture and Rural Development for the period 2021 - 2027. Thematic Working Group (TWG) develops the Plan together with the stakeholders. In the Strategic Plan for the new CAP the support schemes and measures will be listed as interventions.

The document that will determine the direction and development of the Bulgarian agriculture in the next 7 years is of great importance and it should effectively and in a balanced way to reflect and address the real needs and priorities for financing the agricultural sector and the food industry.

### **Transport Connectivity Programme 2021-2027**

Development of intermodal links, introduction of traffic management and safety improvement intelligent transport systems, as well as the construction of key road and rail sections in the country are part of the priorities of Program on "Transport Connectivity" 2021-2027 (PTC 2021-2027), which is due to be sent for approval to the European Commission.

Funds, allocated for the development of transport intermodality in the country amount to over EUR 328 million. Extensions of Port Varna and of Port Lom are envisaged aimed at the creation of conditions for multimodal transport operations. The projects on the construction of the railway links to Burgas airport and to Plovdiv airport and also the assistance of multimodal operators in the country through financial instruments for the development of the existing infrastructure are also among them.

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<sup>89</sup> [https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/rural-development\\_en](https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/rural-development_en)

## **REPUBLIC OF MOLDOVA**

Currently, there is a drastic problem with strategic policy documents, including development programmes in the Republic of Moldova, given that the National Development Strategy "Moldova 2030" has not been approved yet, which is in the process of public consultations, on the one hand, and the National Strategy for Agricultural and Rural Development 2021-2030, which is being developed. In this situation, the information cannot be provided for the analysis of long-term development programmes.

The only action targeting the Giurgiulesti Port Complex provided for the Transport and Logistics Strategy for the years 2013 - 2022, approved by Government Decision No. 827/2013, it should be provided with port facilities to receive waste from its operation on board ships.

## **REPUBLIC OF SERBIA**

A draft for the **IPARD 3** program for incentives for investments in rural development is being prepared, and its accreditation and adoption is expected in the fall of this year, while the first public calls under this program are expected in early 2022. New measures are expected to enable the financing of a wider range of investments.

Investments in water transport and port infrastructure

In 2015, a **Strategy on waterborne transport development of the Republic of Serbia, 2015-2025** was adopted, dealing with broad issues ranging renewing and modernizing the national fleet, to developing the economic potential of Serbian ports and harbours, and developing the navigational standard of international and national inland waterways. Action plan for the Strategy has been elaborated and priority projects and activities are set in order to reach targeted values.

Through its own funds and the use of pre-accession funds, the Republic of Serbia is actively working on the improvement of navigation conditions and the enhancement of port capacity.

Among the current projects, we emphasize:

- hydrotechnical and dredging works on critical sectors of the Danube and Sava, the reconstruction of the navigation lock at HPP Đerdap 1,
- the implementation of the electronic waterway marking system,
- the expansion of port capacity in Smederevo and construction of the rail and road access infrastructure, the expansion of port capacity in Prahovo, Bogojevo and Sremska Mitrovica,
- the construction of new port in Belgrade, while the expansion of the capacities of other ports shall be taken into consideration in accordance with the demand and commercial possibilities.

In addition, PGA has been intensively working, in cooperation with the Ministry of Construction, Transport and Infrastructure, the Border Police Directorate and the Customs Administration, on the



redefinition of border crossing points for river transport, as well as on joint procedures for ships in international traffic, when the port of loading or destination port is in the Republic of Serbia.

By improving overall navigation conditions on inland waterways, as well as by investing in the rail and road networks, we will create the environment for ports to become large logistics centres, which not only perform import and export traffic, but are also capable of accepting significant transit traffic and providing a wide range of logistics services.

## **HUNGARY**

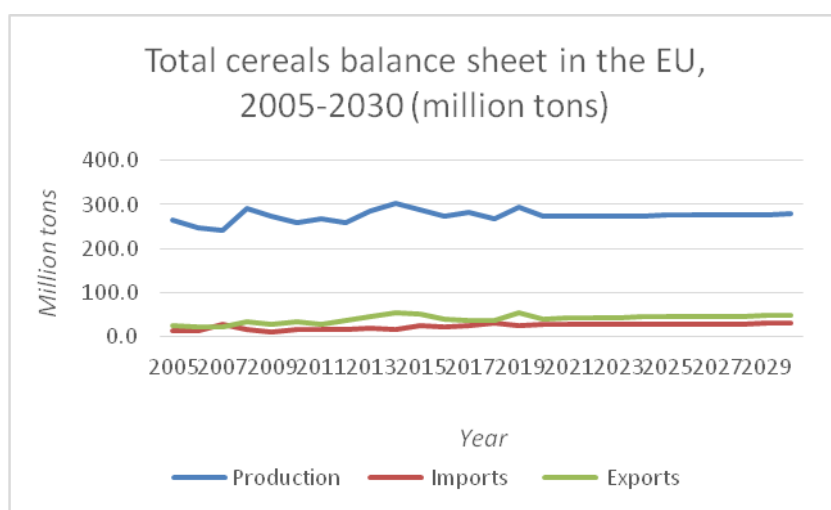
The final versions of the medium-term strategies for the next period are not yet public, so most of the information on expected developments in agriculture can currently be obtained from press reports. Increasing added value in crop and livestock production, while improving profitability, can be identified as a priority. In connection with this goal, significant developments are expected in connection with the modernization of the food industry.

Medium-term plans for river and road network development are also being revised, but a number of projects have already been announced. A number of road developments are expected, which could also benefit intermodal transport, due to easier access, lane expansion is expected in several places, and new road sections are expected to be built to help relieve the capital and connect major rural cities.

## 6 Mid-term perspectives

The mid-term outlook until 2030 for the analyzed categories of cereals and biofuels is presented in below. There is a general outlook on the EU level development by 2030.

From the scenarios calculated by the European Commission, it can be stated that total cereals production in the EU27 in 2020 – 2030 will stagnate at a 0,0% annual growth rate. Imports as well as exports are expected to grow at a rate of 0,7% respectively 0,8% annually.



	Difference <sup>(a)</sup>		Annual growth (%) <sup>(b)</sup>	
	2020-2010	2030-2020	2010-2020	2020-2030
<b>Production</b>	4,8	-1,1	0,2%	0,0%
<b>Imports</b>	13,8	2,0	7,3%	0,7%
<b>Exports</b>	11,5	3,6	3,1%	0,8%

Figure 25: Scenario mid-term 2030 for total cereals EU27<sup>90</sup>

The cereal area cultivated in the EU is currently four times bigger than the one for oilseeds. Cereal area will increase by approx. 1% until 55,6 million ha. The oilseed area could decrease by 200.000 ha until 11,4 million ha.

The pulses area is expected to expand the most with +4% per year over the outlook period 2019 – 2030. The pulses area is expected to reach 2,4 million ha in 2030.<sup>91</sup>

Soft wheat and maize areas are expected to increase. Soft wheat area should reach 23,8 million ha by 2030. Maize area will increase to 8,8 million ha t by 2030, due to higher demand for animal feed and industrial purposes. Durum wheat and barley areas might decline by around 0.5% annually and

<sup>90</sup> Own illustration, data from European Commission [https://ec.europa.eu/info/food-farming-fisheries/farming/facts-and-figures/markets/outlook/medium-term\\_en](https://ec.europa.eu/info/food-farming-fisheries/farming/facts-and-figures/markets/outlook/medium-term_en)

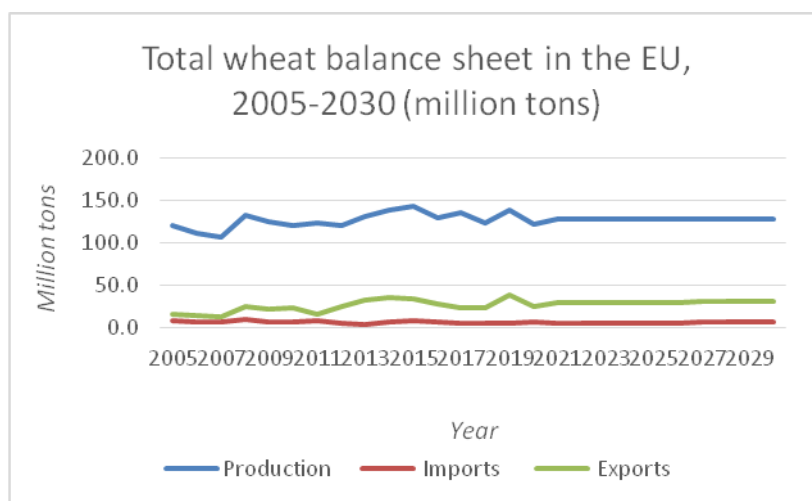
<sup>91</sup> EU agricultural outlook, markets and income 2019 – 2030, p.22

reach 11,6 million ha of barley and 2,4 million ha of durum wheat in 2030. Total cereal production is projected to grow to 319 million tons.

The production of oilseeds is expected to have a positive yearly growth rate, with highest growth rate expected from soybeans (+1,1% between 2020 – 2030).

The sugar beet production will have a negative annual growth of -0,2% between 2020 – 2030, with sugar production stagnating 0,0% annual growth between 2020 – 2030.

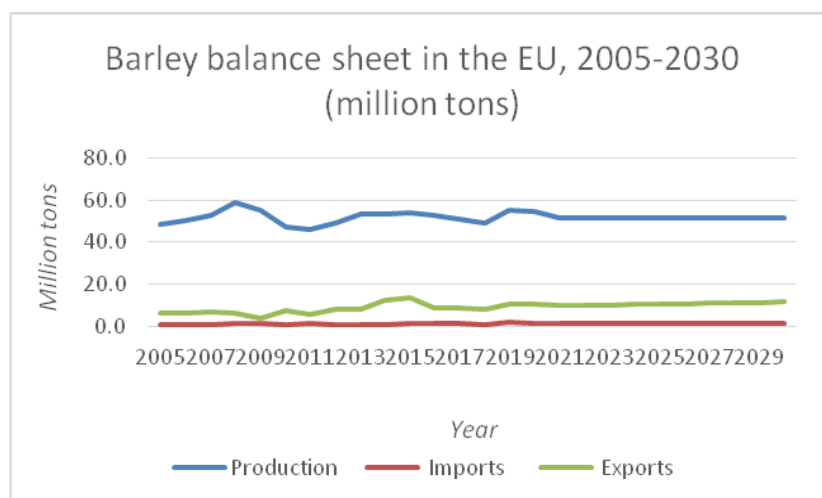
The production of ethanol is expected to increase by 0,4% annually between 2020 – 2030. The production of biodiesel is expected to have a negative annual growth of -1,0% during 2020 – 2030.



	Difference <sup>(a)</sup>		Annual growth (%) <sup>(b)</sup>	
	2020-2010	2030-2020	2010-2020	2020-2030
<b>Production</b>	1,8	-0,2	0,1%	0,0%
<b>Imports</b>	-2,2	0,5	-3,4%	0,8%
<b>Exports</b>	5,4	1,9	2,1%	0,6%

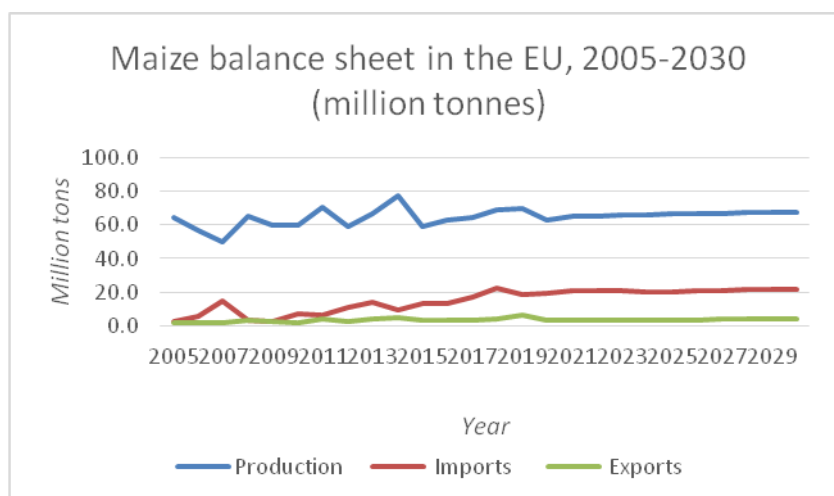
Figure 26: Scenario mid-term 2030 for wheat EU27<sup>92</sup>

<sup>92</sup> Own illustration, data from European Commission [https://ec.europa.eu/info/food-farming-fisheries/farming/facts-and-figures/markets/outlook/medium-term\\_en](https://ec.europa.eu/info/food-farming-fisheries/farming/facts-and-figures/markets/outlook/medium-term_en)



	Difference <sup>(a)</sup>		Annual growth (%) <sup>(b)</sup>	
	2020-2010	2030-2020	2010-2020	2020-2030
<b>Production</b>	-0,7	-1,5	-0,1%	-0,3%
<b>Imports</b>	0,3	0,2	2,5%	1,6%
<b>Exports</b>	4,0	1,9	5,6%	1,8%

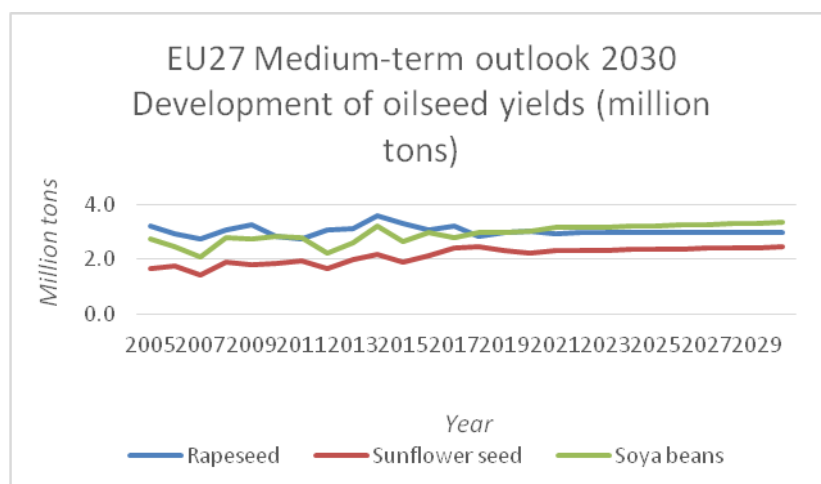
Figure 27: Scenario mid-term 2030 for barley EU27<sup>93</sup>



	Difference <sup>(a)</sup>		Annual growth (%) <sup>(b)</sup>	
	2020-2010	2030-2020	2010-2020	2020-2030
<b>Production</b>	5,6	0,6	0,9%	0,1%
<b>Imports</b>	15,7	1,5	16,7%	0,7%
<b>Exports</b>	2,0	-0,3	6,2%	-0,8%

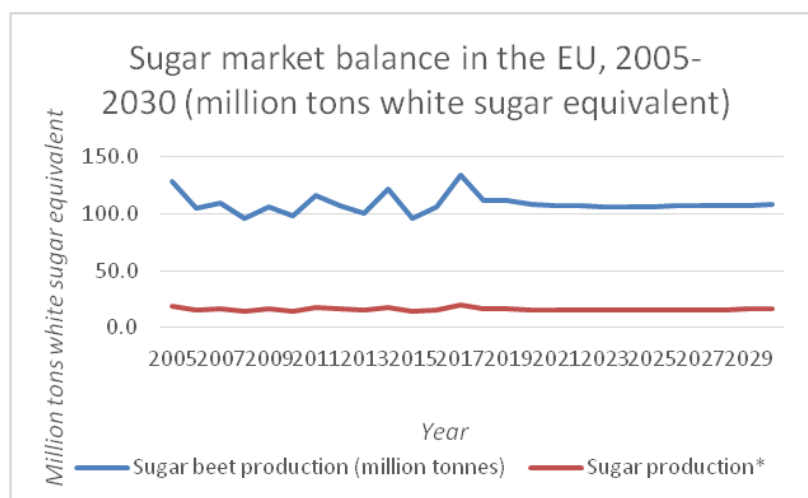
Figure 28: Scenario mid-term 2030 for maize EU27<sup>94</sup>

<sup>93</sup> Own illustration, data from European Commission [https://ec.europa.eu/info/food-farming-fisheries/farming/facts-and-figures/markets/outlook/medium-term\\_en](https://ec.europa.eu/info/food-farming-fisheries/farming/facts-and-figures/markets/outlook/medium-term_en)



	Difference <sup>(a)</sup>		Annual growth (%) <sup>(b)</sup>	
	2020-2010	2030-2020	2010-2020	2020-2030
<b>Rapeseed</b>	-0,1	0,1	-0,4%	0,2%
<b>Sunflower seed</b>	0,5	0,1	2,4%	0,5%
<b>Soya beans</b>	0,2	0,4	0,7%	1,1%

Figure 29: Scenario mid-term 2030 for oilseed yields in EU27<sup>95</sup>



	Difference <sup>(a)</sup>		Annual growth (%) <sup>(b)</sup>	
	2020-2010	2030-2020	2010-2020	2020-2030
<b>Sugar beet produc</b>	10,3	-2,7	1,0%	-0,2%
<b>Sugar production*</b>	1,1	0,0	0,7%	0,0%

Figure 30: Scenario mid-term 2030 for sugar beet and sugar production in EU27<sup>96</sup>

<sup>94</sup> Own illustration, data from European Commission [https://ec.europa.eu/info/food-farming-fisheries/farming/facts-and-figures/markets/outlook/medium-term\\_en](https://ec.europa.eu/info/food-farming-fisheries/farming/facts-and-figures/markets/outlook/medium-term_en)

<sup>95</sup> Own illustration, data from European Commission [https://ec.europa.eu/info/food-farming-fisheries/farming/facts-and-figures/markets/outlook/medium-term\\_en](https://ec.europa.eu/info/food-farming-fisheries/farming/facts-and-figures/markets/outlook/medium-term_en)

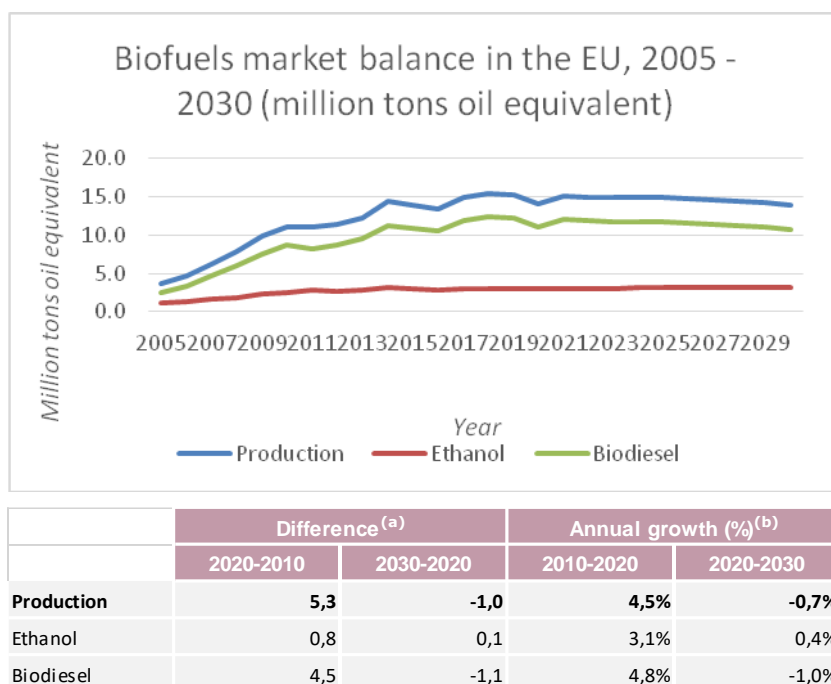


Figure 31. Scenario mid-term 2030 for biofuels in EU27<sup>97</sup>

## 6.1 Strategies on EU level

The new **Common Agricultural Policy CAP** will follow the implementation and objectives of the European Green Deal. After the transitional CAP, the new CAP will allocate 387 billion EUR between 2023 – 2030. 40% of the expenditure shall be done for activities helping reach climate objectives.

Some of the key elements of the new CAP 2023 – 2030 are:

1. Eco-schemes for climate - and environment-friendly farming practices. These schemes will finance for example organic farming, precision farming, carbon farming. Total funding sum will be between 38,7 billion EUR up to 58,1 billion EUR.
2. Agri-environment-climate measures and investments to enhance ecosystems, promote resource efficiency and create a low carbon, climate resilient economy. At least 30% of rural development expenditure must be dedicated to environment and climate.
3. Climate spending. At least 40% of the agricultural and rural development budget should be used for measures and actions intended to help reach climate targets.

<sup>96</sup> Own illustration, data from European Commission [https://ec.europa.eu/info/food-farming-fisheries/farming/facts-and-figures/markets/outlook/medium-term\\_en](https://ec.europa.eu/info/food-farming-fisheries/farming/facts-and-figures/markets/outlook/medium-term_en)

<sup>97</sup> Own illustration, data from European Commission [https://ec.europa.eu/info/food-farming-fisheries/farming/facts-and-figures/markets/outlook/medium-term\\_en](https://ec.europa.eu/info/food-farming-fisheries/farming/facts-and-figures/markets/outlook/medium-term_en)



4. Amendments in the distribution of income support. Because currently approx. 80% of CAP payments go to less than 20% of beneficiaries, the Commission will limit the support to 100.000 EUR per beneficiary per year.

Further upon discussion are elements regarding the expansion of landscape features and non-productive areas (biodiversity), crop rotations and soil protection, water use, protection, pollution and irrigation, animal health and biosecurity.

CAP has currently 9 specific objectives defined:

1. Support viable farm income and resilience across the Union to enhance food
2. Enhance market orientation and increase competitiveness
3. Improve the farmers' position in the value chain
4. Contribute to climate change mitigation and adaptation, as well as sustainable energy
5. Foster sustainable development and efficient management of natural resources such as water, soil and air
6. Contribution to the protection of biodiversity, enhance ecosystem services and preserve habitats and landscapes
7. Attract young farmers and facilitate business development in rural areas
8. Promote employment, growth, social inclusion and local development in rural areas, including bio-economy and sustainable forestry
9. Improve the response of EU agriculture to societal demands on food and health, including safe, nutritious and sustainable food, as well as animal welfare

Support to agriculture in the European Union has declined gradually since the 1990s. Much of the policy discussion in 2019 and early 2020 was dedicated to shaping the next iteration of the Common Agricultural Policy (CAP). In that vein, the first tranche of transitional regulations needed to bridge the gap between the current CAP and the future one was approved by parliament in December 2019, with the new CAP not expected to enter into force before January 2022.

Various regulatory changes outside of the CAP, but with implications for the agricultural sector, went into effect in 2019. These included new rules that banned certain unfair trading practices in the agricultural industry, strengthened food inspections, harmonised rules on the sale of fertiliser, and established harmonised risk indicators for pesticides across Member States in order to facilitate the monitoring of trends in pesticide risk reduction at Union level.

At the Member State level, a host of policy changes focused on the agri-environment and climate. Countries implemented new regulations aiming to improve air quality and reduce ammonia emissions, improve water availability and quality, improve soil conditions, strengthen the circular economy, and achieve national climate targets.

**The European Green Deal** is a growth strategy that aims to transform the EU into a prosperous, fair, competitive and resource-efficient economy, with no net emissions of greenhouse gases by 2050, zero pollution and a decoupling of economic growth from resource use. It is also a response to urgent challenges.

### **European Union Agricultural Outlook for 2018-2030 (report)**

Projections for the European agricultural markets for the period 2018 to 2030 are presented for a wide range of agri-food products, including meat, arable crops, milk and dairy products, and fruit and vegetables. The evolution of agricultural income and the environmental aspects of EU agriculture are also covered in the outlook.

## **European Research and Innovation for Food and Nutrition Security**

This document sets out how EU Research and Innovation (R&I) policy contributes to the major global challenge of ensuring food and nutrition security (FNS). The importance of ensuring FNS and the need for global action was highlighted in September 2015 where the world's Heads of State and Governments adopted the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs).

### **The EU Farm to Fork and 2030 Biodiversity Strategies**

**The Farm to Fork Strategy** is at the heart of the Green Deal. It addresses comprehensively the challenges of sustainable food systems and recognises the inextricable links between healthy people, healthy societies and a healthy planet.

The strategy is also central to the Commission's agenda to achieve the United Nations' Sustainable Development Goals (SDGs). All citizens and operators across value chains, in the EU and elsewhere, should benefit from a just transition, especially in the aftermath of the COVID-19 pandemic and the economic downturn. A shift to a sustainable food system can bring environmental, health and social benefits, offer economic gains and ensure that the recovery from the crisis puts us onto a sustainable path<sup>98</sup>. Ensuring a sustainable livelihood for primary producers, who still lag behind in terms of income<sup>99</sup>, is essential for the success of the recovery and the transition.

**The EU Biodiversity Strategy for 2030** includes 14 key commitments to be achieved by 2030. The strategy highlights that at least 10% of agricultural area should be dedicated to high-diversity landscape features (e.g. buffer strips, hedges and ponds etc). Each Member State will need to translate this 10% target for its own scenarios and conditions and ensure it is appropriately managed through the Common Agricultural Policy and in line with the **Farm to Fork Strategy**.

### **TEN-T:**

The regulation (EU) No 1315/2013 on Union guidelines for the development of the trans-European transport network (TEN-T) defines general objectives and specific technical requirements for the TEN-T network. The Annexes contain maps of the networks (roads, railways, waterways) and a list of the core networks, maritime and inland ports, airports, and intermodal terminals. It has a dual-layer structure which comprises a comprehensive and a core network. The core network is to be completed by 2030, the comprehensive network by 2050.

The TEN-T policy is based on the realization that efficient and well-connected infrastructure is of vital importance for competitiveness, growth, jobs and prosperity in the European Union.

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<sup>98</sup> At global level, it is estimated that food and agriculture systems in line with the SDGs would deliver nutritious and affordable food for a growing world population, help restore vital ecosystems and could create new economic value of over EUR 1.8 trillion by 2030. Source: Business & Sustainable Development Commission (2017), *Better business, better world*.

<sup>99</sup> For example, the average EU farmer currently earns around half of the average worker in the economy as a whole. Source: CAP Context indicator C.26 on Agricultural entrepreneurial income ([https://agridata.ec.europa.eu/Olik\\_Downloads/Jobs-Growth-sources.htm](https://agridata.ec.europa.eu/Olik_Downloads/Jobs-Growth-sources.htm)).

## 6.2 Development plans and strategies at country level

### AUSTRIA

The Positive Agricultural Sector Model Austria PASMA was developed to estimate the impact of the CAP reform and measure rural/ agricultural development. PASMA uses information on resource and production from 35 regional production units (i.e. NUTS-3) in Austria and calculates development scenarios. The baseline economic assumptions for the Austrian scenario proposed by PASMA in year 2018 are:

Table 1: Assumptions on macro-economic variables in the European Union, 2018 – 2027

		2018	2019	2020	2021	2022	2023	2024	2025	2016	2027
real GDP	%	2.0	1.7	1.6	1.6	1.6	1.5	1.5	1.5	1.5	1.4
price deflator	%	1.6	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.7
GDP deflator	%	1.4	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Population	%	0.15	0.13	0.11	0.08	0.06	0.05	0.03	0.03	0.02	0.02
world oil price	USD/barrel	63.7	67.1	68.3	69.3	70.4	71.5	72.6	73.7	74.9	76.1

Source: OECD-FAO, 2018.

Figure 32: AUSTRIA - Baseline assumptions on macro-economic variables in the EU 2018 - 2027<sup>100</sup>

Table 2: Assumptions on macro-economic variables for Austria, 2010 – 2050

parameter	2010	2020	2030	2040	2050
Population (in Mill)	8.4	8.8	9.3	9.6	9.7
GDP (bn €2013)	298.1	344.7	400.1	469.0	542.5
Household income €2013/person	19,637.1	21,688.4	24,047.8	27,675.8	32,366.6
Exchange rate US\$/€	1.326	1.2	1.2	1.2	1.2
oil price [US\$ 2016/boe]	n.a.	96.7	120.9	133.6	148.5
carbon price (EUR 2016/t CO <sub>2</sub> )	n.a.	15.5	34.7	51.7	91.0

Source: Umweltbundesamt (2018) based on GEM-E3.

Table 3: Observed and projected nominal farm prices for crop products in Austria  
(€ per ton or 100 l)

	€2007/2009	€2015/2017	2020	2030	2040	2050
Wheat	143.17	138.35	139.69	153.90	167.71	181.53
Coarse wheat	114.46	118.45	119.60	131.77	143.59	155.42
Durum	209.47	206.34	208.34	229.53	250.13	270.73
Rye	120.13	127.81	134.32	149.33	163.35	177.37
Coarse grains	101.50	106.15	111.55	124.02	135.66	147.30
Barley	113.52	107.13	112.58	125.16	136.91	148.66
Oats	110.30	125.67	132.07	146.83	160.61	174.40
Triticale	108.88	110.38	115.99	128.96	141.06	153.17
Spelt	261.83	257.92	260.43	286.92	312.67	338.42
Maize	131.00	136.68	143.63	159.69	174.68	189.67
Beans	223.37	262.71	279.69	333.55	386.49	439.43
Peas	142.29	155.04	165.07	196.86	228.10	259.34
Soy-beans	282.54	332.31	342.78	396.76	452.06	507.36
Sunflower	228.95	296.09	305.43	353.52	402.79	452.07
Sugar-beet	27.97	26.29	26.91	31.60	36.14	40.68
Starch potatoes	55.09	88.16	92.65	103.01	112.67	122.34
Rape-seed	275.35	327.57	337.90	391.10	445.62	500.14
Fruits	343.47	342.93	343.03	339.84	338.12	336.40
Wine	365.00	770.23	728.66	772.18	793.85	815.52

Source: own assumptions based on OECD-FAO, 2018.

<sup>100</sup> Austrian Agriculture 2020-2050 Scenarios and Sensitivity Analyses on Land Use, Production, Livestock and Production Systems Franz Sinabell (WIFO), Martin Schönhart, Erwin Schmid (INWE-BOKU), 2018, p.18

In Austria, agricultural land is losing acreage due to the trend of urbanisation and traffic infrastructure. It is expected that arable land will decline by 11% until 2050.

The reduction of agricultural land implies that crops with comparatively higher yields and yield increases will become more competitive.

This model implies that pests are not very likely to restrict the expansion of specific crops, mainly because the policies guarantee minimum crops.

In 2050, the acreage of crop legumes will stay like the one now. According to this model, the strongly growing soybean production which was observed since 2014 is going to stabilise.<sup>101</sup>

The sales of mineral nutrients are likely to decline slightly.

Another scenario developed in 2015 for the estimation of self-sufficiency in Austria by 2030, respectively 2050 shows following development of crop yields. The impact factors chosen are climate change, technical progress, P-fertiliser quantities and the input level:

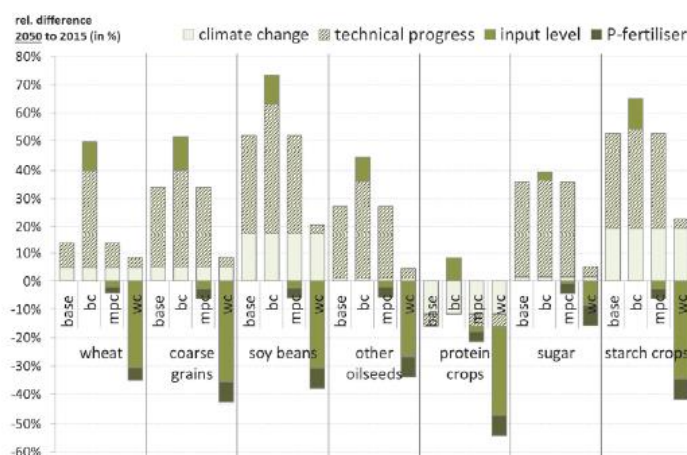


Figure 1. Impact of scenario-specific assumptions on crop yields (2050 rel. to 2015, in %). Base=baseline; bc=best case; mpc=most probable case; wc=worst case.

Figure 33: AUSTRIA - Impact of scenario-specific assumptions on crop yields<sup>102</sup>

<sup>101</sup> Austrian Agriculture 2020-2050 Scenarios and Sensitivity Analyses on Land Use, Production, Livestock and Production Systems Franz Sinabell (WIFO), Martin Schönhart, Erwin Schmid (INWE-BOKU), 2018, p.27

<sup>102</sup> Food self-sufficiency in Austria: simulation results for 2030 and 2050 C. Tribl, J. Hambrusch and K. Mechtler, 2015, p. 78

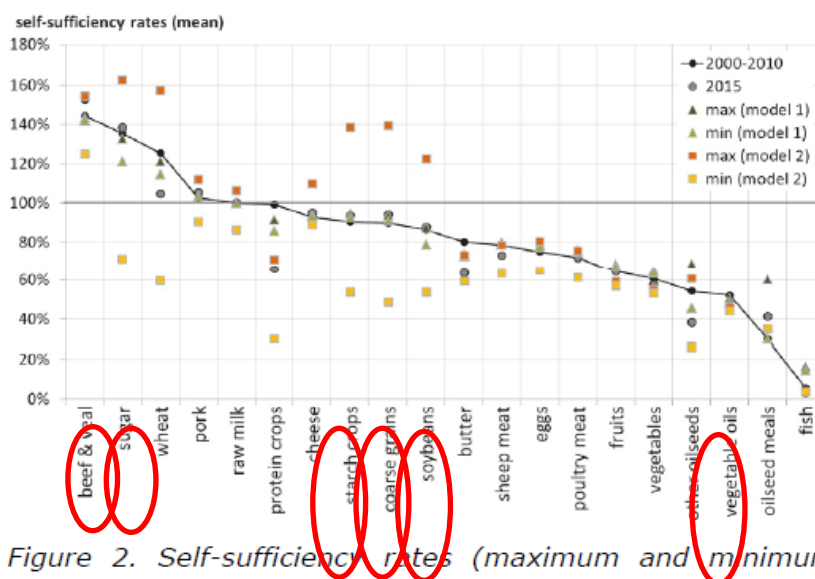


Figure 2. Self-sufficiency rates (maximum and minimum mean of four scenarios for both 2030 and 2050).

Figure 34: AUSTRIA - Self-sufficiency rates for the above scenarios for different foodstuffs<sup>103</sup>

The main strategies of the Austrian Government are connected to the general directions of the European Green Deal and of the new CAP. These were already discussed in the chapters above.

Also relevant are the development plans and strategies for increasing the volume of agricultural products transported by water in Austria, which can be summarised as follows:

- increase support of business settlements along the waterways, by cooperating with business agencies and relevant stakeholders;
- consider expansion opportunities at the interface to the bioenergy sector;
- consider expansion opportunities regarding organic products;
- pursue the digitalization of IWT management;
- develop transshipment facilities for combined transport and railway connections designed to support the modal shift of freight from road to rail and water;
- extend the trimodal logistics (warehousing);
- improve loading/ unloading facilities where necessary;
- improve waterway maintenance;
- equip ports to withstand climate change effects (e.g. flood and low water periods)
- develop cost-saving infrastructure and pass along cost savings to customers;
- secure tax and promotional benefits;
- develop measures and activities to discourage road freight transport.

<sup>103</sup> Food self-sufficiency in Austria: simulation results for 2030 and 2050 C. Tribl, J. Hambrusch and K. Mechtler, 2015, p. 78



## **BULGARIA**

**The National Plan for Development of Combined Transport in the Republic of Bulgaria until 2030 (NPDCTRB - 2030)** is prepared in implementation of the Agreement of 14.01.2020 with subject "Preparation of a draft National Plan for Development of Combined Transport in the Republic of Bulgaria until 2030." The assignor of the plan is the Ministry of Transport, Information Technologies and Communications (MTITC), and the financing is under the Operational Programme "Transport and Transport Infrastructure" 2014-2020.

NPDCTRB - 2030 is in a direct hierarchical relationship of subordination with the Integrated Transport Strategy in the period until 2030 (ITS-2030).

**The National Development Programme BULGARIA 2030** is a strategic framework document, which determines the vision and the overall goals of development policies in all sectors of state governance, including their territorial dimensions. The document sets out three strategic goals which will be implemented by government policies, grouped into five development areas (axes) and puts forth 13 national priorities. In the context of Axis 2, **Priority 6 Sustainable Agriculture**, the policies for developing sustainable and diversified agriculture will be continued.

Key to the development of agriculture will also be the advent of digital technology.

**Priority 7 Transport connectivity** is directly related to the NPDCTRB -2030, and in particular Sub-priority 7.4 Combined transport, according to which the support of intermodal / combined transport will remain a priority for transport policy in order to increase the attractiveness and develop its potential.

**The CAP Strategic Plan 2021-2027** is still under preparation and the design of the specific interventions has not yet been finalised. The planning of the CAP Strategic Plan based on sectoral analyses for the new CAP was launched in mid-2020. The official presentation of the first version of the Bulgarian CAP Strategic Plan is scheduled for April 2021.

**Strategy for Digitisation of Agriculture and Rural Areas in Bulgaria (for the period until 2027)** It will support activities such as the implementation of precision agriculture, robotization of manufacturing processes in the farm and digital marketing.

## **CROATIA**

### **A lot of public resources are devoted to the agri-food sector**

Over the current (2014-2020) programming cycle, under the EU's European Maritime and Fisheries Fund (EMFF), Croatia's overall financial envelope (including EU and national funds) amounts to EUR 348.7 million. Meanwhile, Croatia's overall financial envelope under the current EU Common Agricultural Policy (CAP) is nearly EUR 3.4 billion<sup>104</sup>. Unlike most EU Member States, where direct payments (Pillar I) represent on average 75-80% of CAP expenditures, 57% of Croatia's current CAP expenditures are channeled towards rural development (Pillar II), 40.5% to Direct Payments, and

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<sup>104</sup> European Commission (2014): *Multiannual Financial Framework 2014-2020 and the financing of the CAP*, available at [https://ec.europa.eu/agriculture/sites/agriculture/files/cap-funding/budget/mff-2014-2020/mff-figures-and-cap\\_en.pdf](https://ec.europa.eu/agriculture/sites/agriculture/files/cap-funding/budget/mff-2014-2020/mff-figures-and-cap_en.pdf)



2.1% to Market Measures. Considering that direct payments in Croatia are still being phased over a 10-year transitional period, the share of combined spending in agriculture will likely remain high until 2022.

**Croatia’s Rural Development Program (RDP 2014-2020) currently covers a broad range of intervention measures.**

The RDP (2014-2020) currently funds a total of 18 (out of 20) measures in support of all 6 EU rural development priorities and all 3 cross-cutting objectives for innovation, environment, and climate change mitigation and adaptation. The four largest rural development measures in budgetary terms under the RDP 2014-2020 are investments in physical assets (28.7%), payments in areas facing natural or other specific constraints (13.5%), basic services and village renewal (11.2%), and farm and business development (11%).

**REPUBLIC OF MOLDOVA**

1. National Development Strategy "Moldova 2030" - in the process of public consultations. In 2020, the Strategy was promoted by the Government and approved by Parliament, but was not promulgated by the President of the Republic of Moldova.
2. National Strategy for Agricultural and Rural Development 2021-2030 – in course of elaboration.
3. The transport and logistics strategy for the years 2013 - 2022, approved by Government
4. The Land Code, approved by Law
5. The Code of Commercial Maritime Navigation of the Republic of Moldova, approved by Law
6. Rail transport code, approved by Law
7. The Road Transport Code, approved by Law
8. Law on the International Free Port "Giurgiulesti"
9. Water Act
10. Law on the principles of subsidy in the development of agriculture and the rural environment

**REPUBLIC OF SERBIA**

**The Strategy of Agriculture and Rural Development of the Republic of Serbia for the period 2014-2024** Strategic goals and directions of agricultural development in Serbia are based on the Strategy of Agricultural and Rural Development of the Republic of Serbia for the period 2014-2024. Serbia needs to define budgetary incentives and adopt laws and rulebooks that facilitate agricultural development, as well as greater farmer training and exposure to new technologies. In addition to the Agriculture and Rural Development Strategy, the MAEP prepared the National Development

Programs 2015 - 2020, with more specific measures for implementing the Agriculture and Rural Development Strategy.<sup>105</sup>

Due to the Serbian participation in European integration processes, one of the tasks is to harmonize with the EU economic model. Therefore, the Strategy of Agriculture and Rural Development of the Republic of Serbia for the period 2014-2024., among all has been establishing three most important segments of reforms: 1) reform of agri-policy, 2) establishment and full implementation of the legislative framework, and 3) Institutional reforms.

### **National Programme for Agriculture for the period 2018-2020.**

Besides, as mid-term development documents covering this sector exist the National Program for Agriculture for the period 2018-2020. and National Rural Development Program for the period 2018-2020. These programs are operationalizing the strategic plan and envisage the measures and activities for adjustment of agricultural policy with the Common Agricultural Policy of the EU during the pre-accession period.

The legislative framework which defines the implementation of the IPARD II Programme in the Republic of Serbia was enforced.

### **Law on the Budget of the Republic of Serbia**

Budget funds intended for the implementation of agricultural and rural development measures on an annual basis are defined by the Law on the Budget of the Republic of Serbia for one calendar year, within the budget allocated to the MAFWM. Every year the Regulation on Allocation of Subsidies in Agriculture and Rural Development defines the volume of funds, types of subsidies and maximum amounts by type of subsidies for the current year.

## **SLOVAKIA**

Strategic plan for the period 2021 – 2027 is at the time of elaboration of this Country report under preparation. No particular results and strategies available.

## **HUNGARY**

**Hungary's food economy program 2016-2050**, having as goals:

- the gross value added of the food industry should be 2.5 times the gross value added of agriculture
- agricultural exports should reach EUR 20 billion at current prices

### **National Transport Infrastructure Development Strategy:**

Focuses of the Strategy:

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<sup>105</sup> <https://www.export.gov/apex/article2?id=Serbia-Agribusiness>

- Based on real traffic needs, interconnects supply chains.
- Optimizes social impacts
- Cost-effective in developments: focuses on low-cost, higher-yielding, sustainable investments.
- Cost-effective and economical in operation which leads to cost savings in the long term.

Freight:

- The position of rail freight transport can be maintained, development is expected in the long term. An interoperable system resulting from infrastructural developments, combined with an attractive road access charge, can have an appeal to private capital.
- The development of ports will make it possible to maintain or slightly increase the positions of water transport.
- In Budapest, the urban freight transport system can also achieve a better level of service, as well as by railway, which can have an appeal to private capital.

**National Port Development Plan**, with the following strategic objectives:

- **Encouraging modal shift:** improving port accessibility, increasing loading and storage efficiency, digital port, sustainable port, promoting ports and waterborne freight transport, following freight transport trends
- **Generating additional demand:** the strategy calls for additional demand for port services in two areas (market adaptation, industrial installation, service development)
- **Development of a financing system:** The system to be set up should be followed when assessing the order and importance of grants and investments.
- **Human resources development:** The strategy urges to address port labour shortages by involving three sub-areas. (filling of skills shortages, wage development, development of training programs)
- **Creating a sustainable regulatory environment:** The strategy calls for intervention in three areas. (clarification of official powers, rationalization of the regulatory system, environmental sustainability of ports)

## 7 Findings - Stakeholder interviews / Identified best practices / Recommendations

Country	Stakeholder Interview	Findings / conclusions / recommendations
AUSTRIA	<p><b><u>Stakeholder Interview 1</u></b>  <b>University of Natural Resources Life Sciences</b>  <b>Univ. Prof. Dipl.-Ing. Hans-Peter Kaul</b>            Head of Institute of Crop Sciences            Gregor-Mendel-Street 33, 1180 Vienna, Austria</p> <p><b><u>Stakeholder Interview 2</u></b>  <b>Federal Ministry of Agriculture, Regions and Tourism</b>            Federal Institute of Agricultural Economics  <b>Dipl.-Ing. Thomas Resl, General Director</b>            Marxergasse 2, 1030 Vienna</p> <p><b><u>Stakeholder Interview 3 / Best practice example</u></b>  <b>Danube Soya Association</b>  <b>Matthias Kroen</b>            President  <b>Leopold Rittler</b>            Head of Research and Innovation            Wiesinger Strasse 6, 1010 Vienna</p>	<p><b>Scope of the interview:</b> Status-quo and mid-term outlook of growth potentials for each of the main categories of agricultural products, including critical factors in Austria</p> <p>Based on the analysed data and the inputs received from the stakeholder interviews, it is safe to make following recommendations for increasing the volume of agricultural products transported by water in Austria:</p> <ol style="list-style-type: none"> <li>1. Increase support of business settlements along the waterways, by cooperating with business agencies and relevant stakeholders. Especially increased settlement of processing plants for e.g. soybeans along the Danube. The main agricultural production areas in Austria are in the eastern parts in the regions of Lower-Austria, Upper-Austria and Burgenland. The Danube river is crossing this area.</li> <li>2. Consider expansion opportunities emerging from trade of soy for feed. Assuming that feeding in pig production will be switched to GMO-free feed, it is expected that demand in Austria will increase to 300.000 to 400.000 tons per year. Accordingly, it is to be expected that the demand for GMO-free soy for pig production in Germany will develop. Considering that these transport quantities are also shipped on the Danube, high growth rates are generally to be expected for the transport of soy on waterways. It is estimated that around half of the required quantities of soy in Austria and Germany are delivered via the Danube as a transport route.</li> <li>3. Consider expansion opportunities at the interface to the bioenergy/biofuels sector. With regard to biofuels, it can be stated that a bioeconomy strategy has been worked out in Austria but has only been implemented in certain areas to date.</li> <li>4. Consider expansion opportunities regarding organic products. Austria is EU organic country number 1 and this trend is to continue by 2030.</li> <li>5. Consider expansion opportunities with the trade/import of raw materials and export of citric acid. The citric acid production of Jungbunzlauer is expected to expand from 400.000 tons to 600.000 tons per year. In this regard, the waterway is particularly suitable as a means of transport. The wet maize, which is mainly used as a raw material for citric acid production, is currently mainly transported by train or truck.</li> <li>6. Pursue the digitalization of IWT management.</li> <li>7. Further develop transshipment facilities for combined transport and railway connections designed to support the modal shift of freight from road to rail and water. Extend the</li> </ol>

		<p>trimodal logistics (warehousing, silos).</p> <p>8. Further improve loading/unloading facilities where necessary, depending on the agricultural produce/biofuels/fertilizers.</p> <p>9. Further improve waterway maintenance and equip ports to withstand climate change effects (e.g. flood and low water periods)</p> <p>10. Develop cost-saving infrastructure on harbours and pass along cost savings to customers, as incentives for modal shift.</p> <p>11. Secure tax and promotional benefits.</p>
<b>BULGARIA</b>	<p><b><u>Stakeholder Interview 1</u></b></p> <p><b>Atanas Bozhkov – Chairman of the Union of Mixed Feed Producers</b></p> <p>Place and time of the interview: phone interview, April 2021</p> <p><b><u>Stakeholder Interview 2</u></b></p> <p><b>Grigor Marinov – Agricultural producer of corn and triticale, Ruse region</b></p> <p>Place and time of the interview: phone interview, April 2021</p>	<p><b>Scope of the interview:</b> Dionysus project, Integrating Danube Region into Smart &amp; Sustainable Multi-modal &amp; Intermodal Transport Chains - Assessment of growth potentials for main agricultural products</p> <p>The Bulgarian producers of feed do not use financial resources from the previous Rural Development Programme (2014-2020). The reason is that they are processors of agricultural products, not producers, and the factories are not actually located in rural areas. Mr. Bozhkov stressed that according to his preliminary information, no funds will be allocated in the new programming period of RDP to support the feed sector. To develop the sector, producers rely on loans or their own funds.</p> <p>Mr. Marinov informed that under one of the measures - for the modernization of farms – grain producers had previously the opportunity to buy new agricultural machinery. He mentioned that according to his preliminary information, during the new programming period, there will be no funding for the grain producers.</p> <p>During the interviews with the stakeholders the Chairman of the Union of Mixed Feed Producers informed BRCCI that the companies have problems with the crossing of the new border checkpoint in Silistra.</p> <p>Currently, the trucks with the feed have to wait a long time at the temporary checkpoint and respectively on the ferry. At the same time, the ferryboat has a limited capacity and cannot take all the trucks. The idea of redirecting the traffic of heavy trucks out of Silistra is very good, but the delay in deliveries in this case is huge and price increases.</p> <p>The members of the Union of Mixed Feed Producers recommend a solution to be found for increase the working capacity of the ferryboat between Silistra and Calarasi, in order the accumulation of trucks and respectively the delay in the deliveries to be avoided. The new ferryboat crosses the Bulgarian state border, and this requires verification of documents. The old checkpoint operating on the pedestrian border was inconvenient from a logistical point of view (the trucks were in the town), but according to Mr. Bozhkov it was faster as a service, because crossing the Danube was ONLY on Romanian territory (i.e. the documents were processed before arrival at the terminal).</p>
<b>CROATIA</b>	<p>Stakeholder interview was formed in a way where selected stakeholders whose views and impact in the industry carries a significant role for</p>	<p>Not reflecting back to the previous period, stakeholders are cheerfully awaiting the next cycle of rural development for the period of 2021. – 2027.</p>

	<p>further advancement and overall development. Interview consisted of drafting a simple and brief interview consisting of four general questions:</p> <ol style="list-style-type: none"> <li>1. What is the current status of agricultural development strategies for the next period until 2030?</li> <li>2. What are the priorities and what financial instruments will be available in the new Rural Program development for the period from 2021 to 2027?</li> <li>3. Can you present us at least one example of good practice in agriculture in previous period?</li> <li>4. What would you recommend as necessary steps in the revitalization and development of the agricultural sector of the Republic of Croatia?</li> </ol> <p>Stakeholders: non-profit organizations, associations, local representatives of local communities from the non-profit sector, entrepreneurship, local government units and other organizations operating in this area to companies known for their recognizable and superior production activities.</p>	<p>As a part of M4 measure (Investments in physical assets) numerous investments have become available to Croatian farmers for the duration of the IPARD pre-accession program. Now the scope of investment is far wider. The measure enables numerous investments in primary agriculture and processing of agricultural products, as well as in activities aimed at irrigating agricultural areas and preserving landscape values.</p> <p><b>Example of good practice</b></p> <p>In the villages across the Croatian regions, professional farmers who cultivate significant areas with new, modern and efficient mechanization are recognized and their work is emphasized. For many, just a small initial capital investment is enough of an incentive to get started. Public recognition strengthens and motivates pioneers in Croatian regions. Furthermore, joint performance during presentations of innovative projects is often the first step to sharing experiences and networking effects that move as ripples on water surface.</p> <p><b>Recommendations</b></p> <p>For revitalization, it would be necessary to put the local product in the focus. This problem could be solved by associating short supply chains so that producers are members, and public procurement focuses on quality and freshness, i.e. (short supply chain) so that there is no benefit.</p> <p>Second recommendation would be focusing on finalization of primary agricultural products and placement of such finalized products on global market: brewing barley-malt; soybean feed; corn-ethanol, animal feed; wheat flour and flour products.</p>
<b>REPUBLIC OF MOLDOVA</b>	<p>No stakeholders interview were taken.</p>	<ol style="list-style-type: none"> <li>1. Development of the National Strategy for Agricultural and Rural Development 2030, including the action plan.</li> <li>2. Increase, diversification and modernization of the storage capacity of cereal silos.</li> <li>3. Location of cereal silos within the perimeter of the railway network and the national road network.</li> <li>4. Design and construction of a plant of chemical fertilizers.</li> <li>5. Transport of cereals to the International Free Port "Giurgiulesti" by rail transport.</li> <li>6. Modernization of the fleet of wagons for the transport of cereals.</li> <li>7. Increase in exports of value-added products as cereals and oilseeds.</li> </ol>
<b>REPUBLIC OF SERBIA</b>	<p><b><u>Stakeholder Interview 1</u></b> <b>The Ministry of Agriculture, Forestry and Water Management, Republic of Serbia</b></p> <p><b><u>Stakeholder Interview 2</u></b> <b>Directorate for Agrarian Payments</b></p>	<p>Besides the infrastructure which will enable efficient transport of goods by waterways, it is important to follow the recommendations from national strategies for the development of the agricultural sector. Regarding that, it is necessary to organize education of the potential end users (farmers, agricultures, companies etc.), in order to introduce them the possibilities of the different EU instruments for Pre-Accession Assistance in the Field of Rural Development.</p> <p>Based on the research conducted, the following conclusions and recommendations can be made for increasing the volume of</p>



	<p><b><u>Stakeholder Interview 3</u></b></p> <p><b>Hibrid Company Ltd. Belgrade, Port “Danube-Bogojevo” Ltd.</b></p>	<p>agricultural products transported by water.</p> <p>Agricultural products which are exported the most are: corn, white sugar, raspberry, wheat, sunflower oil, edible and raw, beer made from malt, fresh apples, griz raspberry, soybean oil etc.</p> <p>For agricultural and food products, for which the transport requires specific temperature regulations, the current trade has been done by road transport.</p> <p>Cereals and oilseeds are transported by inland waterways in Serbia. The export of corn in 2019 amounted 3.1 million tonnes, because of the good yield of corn for two years in a row, but also uniform exports throughout 2019. Of the total volume, 71.08% was shipped by the Danube.</p> <p>Although affected by unstable navigable conditions along the Danube and changeable demand on the international market, utilisation of IWT for transport of certain types of agricultural products is satisfying and ranges from 50%-70% of total export.</p> <p>However, the competitiveness of the IWT is still limited due to the congestions in ports during the export campaign, lack of storage capacity and depending on hydro metrological conditions. By strengthening the role of inland ports and improving intermodal transport infrastructure and connections, the volume and share of inland waterway freight traffic could be increased compared to other modes of transport.</p> <p>With the achieving strategically important conditions in terms of corresponding infrastructure and superstructure (reliable navigable conditions, port and warehousing facilities, access infrastructure), promotion campaigns, close coordination with the industry and continuous training on different levels will be significant for achieving full utilization.</p> <p>The Port “Danube-Bogojevo” Ltd. is a company for providing port services, reloading, unloading, warehousing and storage of, primarily, grains, then oilseeds and mineral fertilizers. An optimal location for further expansion and construction of reloading and storage terminals, all with the purpose of exploiting Serbian agrarian potentials in export. The possibility of concentration, manipulation and transportation, especially of grains, is an important factor for our positioning both on the domestic and global market.</p> <p>The Government of Serbia has initiated expansion of the port capacities in Port of Bogojevo. Goal of the project is construction of new silos for storage of grains and oilseeds.</p>
<p><b>SLOVAKIA</b></p>	<p><b><u>Stakeholder interview 1</u></b></p> <p><b>Entity: Association of Sugar Beet Growers of Slovakia (Zväz pestovateľov cukrovej repy Slovenska)</b></p> <p>Interviewee: Ing. Peter Závodský, Executive Director</p> <p>Place and time of the interview: phone interview, 1.4.2021.</p>	<p>Scope of the interview was current situation of sugar beet growing in Slovakia. Mr. Závodský stressed out significant pressure of supranational corporations that own all sugar-processing facilities and therefore control the market. Slovakia is more-or less self-sustainable in term of sugar-beet production. Overproduction oscillates around 10% that is processed in neighboring countries by facilities owned by mentioned supranational entities. Sugar beet is quite fragile in terms of transport conditions; therefore, the strategy is to process the sugar beet in the nearest facilities and afterwards transport final product (mostly sugar) in proper packaging. Water transport is not considered suitable for transport of sugar beet because of short distances and transport condition. Preferred transport mode is rail and/or road transport.</p>

	<p><b><u>Stakeholder Interview 2</u></b></p> <p><b>Entity: Slovak University of Agriculture in Nitra,</b></p> <p>Interviewee: prof. Ing. Ján Gaduš PhD, professor at Department of Regional Bioenergetics</p> <p>Place and time of the interview: phone interview, 14.4.2021.</p> <p><b><u>Stakeholder interview 3</u></b></p> <p><b>Entity: Duslo, a.s.</b></p> <p>Interviewee: Ondrej Marko, Head of Sales Department,</p> <p>Place and time of the interview: phone interview, 14.4.2021.</p>	<p>Scope of the interview was current situation and trends in biogas production. Currently there are around 107 facilities in Slovakia producing electricity from biogas. 85% of input material is corn silage produced in Slovakia. Supply is sufficient for biogas production and it is not necessary to import. According to the trend in EU, Slovakia and the world globally increased demand for electricity from biogas is expected. There are transition intentions from standard raw materials of the first generation (corn, rape) to second's generation materials (wood chips, lop, straw). Disadvantage for production is Slovakia would be necessity of greenhouses or similar environment because of seasonal weather changes.</p> <p>Duslo, a.s. is Slovak major producer of artificial fertilizers. Company is also an important exporter of fertilizers. Preferred transport mode is railway; however, 80-100 thousand tonnes are annually transported via Danube river. Waterway transport has declining trend (low water level on upper Danube). Due to navigability issues and unpredictability of water level, railway transport becomes more reliable and thus preferred. Artificial fertilizers are hydrophobic and when transported by vessels they must be protected by cover. During summer when outside temperature is above 30 degrees, even higher temperature under the covers causes the granules to disintegrate. Long exposure to high temperatures (caused by bad navigability) result in depreciation of cargo and causes financial loss to producers. Waterway transport does not cover first and last mile connection. Product must be transported from the facility to port, loaded to vessels, transported to destination, unloaded to trucks or rails and transported to its final destination. After calculation of all cost of transshipment, railway transportation becomes less costly.</p> <p>Selected recommendations are following:</p> <ul style="list-style-type: none"> <li>• to develop a long-term concept for agriculture and food with regard to EU strategic documents (CAP Strategic Plan 2021-2027, Green Deal) Farm to Table Strategy, Biodiversity Strategy, Instrument for Recovery and Resilience 2021-2024 - Next Generation EU, self-sufficiency and others) and make them a comprehensive support system,</li> <li>• to consider introducing support instruments to support the construction of vertical structures so that home-grown raw materials are also processed into food at home, thus generating increased added value,</li> <li>• to promote a level playing field and CAP instruments for all EU Member States, in particular addressing the level playing field of direct payments within the EU,</li> <li>• to adopt the state legislation in the field of agriculture, food industry and to harmonize it with the EU legislation in order to unify the conditions of the common EU market,</li> <li>• to revise the current legal regulation of ownership and use relations to land in accordance with the Constitution of the Slovak Republic in order to balance the position of land owners in relation to its users,</li> </ul>
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		<ul style="list-style-type: none"> <li>• to continue supporting land readjustment as a basic systemic tool for the rational arrangement of ownership and user relations to agricultural land and the revitalization of agricultural land,</li> <li>• to stabilize / expand agricultural production, and thus to support employment by expanding local, resp. regional sales of products, local and regional markets with a positive impact on increased sales of domestic production and the quality of rural life,</li> <li>• to develop systemic arrangements and credit frameworks for the provision of long-term loans from commercial banks for the purchase of agricultural land,</li> <li>• to create systemic measures and credit frameworks for lending from banks for technological renewal and innovation in the food industry,</li> <li>• to address the systemic riskiness of agricultural production, in particular the effects of uninsurable risks, which are not the subject of insurance for all crops of commercial insurance companies,</li> <li>• to reconsider the possibilities of reducing VAT on selected foods</li> </ul>
<p><b>HUNGARY</b></p>	<p><b><u>Stakeholder interview 1</u></b> <b>Hungarian Grain and Feed Association (Grain Association)</b> Interviewee: Péter Kiss, President</p> <p><b><u>Stakeholder interview 2</u></b> <b>Association of Hungarian Logistics Service Centers (MLSZKSZ)</b> Interviewee: Koppány Ajtony Bíró, Secretary General</p> <p><b><u>Stakeholder interview 3</u></b> K&amp;K Agrár Ltd. grain producing company Interviewee: László Pfundtner,</p>	<p>One of the key factors in 'going green' is the need to place developments on a scientific basis, relying heavily on research and technological results. 'Going green' is also important in the areas of production and processing as well as logistics, some of which he has highlighted. It desirable that, in addition to grants focusing on producers, resources and development opportunities aimed at the processing industry and trade-suppliers should also appear more emphatically. On the logistics side, he said that inland waterway transport accounts for a significant volume, but still lags behind rail and road capacities, citing unpredictable Danube water levels and navigability as some of the reasons, so it is necessary to allocate resources to this area as well.</p> <p>Operational Programs for the period 2021-2027 - We had the opportunity to formulate proposals for the forthcoming tenders several times. Several principles and guidelines were adopted, we received feedback on that. We do not yet know how these will appear for each call for tender, but we hope that we will have a chance to comment before finalizing. So far, we do not know exactly what tenders will be for some of the special needs of agricultural product logistics. Tenders are already being prepared for general logistics tasks - part of the agricultural logistics can fit in here (which requires pallet or big-bag storage). Silo storage and its machinery are in question for the time being, but there will certainly be a tender for this as well. If there is no tender available, then it comes to the own funds and bank loan mixture, depending on the financial capabilities of the companies.</p> <p>The company works on 2,200 hectares of arable land and is also engaged in animal husbandry. No direct funding sources have been used for the developments, but area-based grants are also helping farmers (direct payments). He has no substantive information about the agricultural development programs for the period 2021-2027; essentially, in the coming years he would like</p>

	<p>Managing Director</p> <p><b><u>Stakeholder interview 4</u></b></p> <p>Institute of Agricultural Economics (AKI)</p> <p>Dr. Norbert Potori, Director</p> <p><b><u>Best practice example</u></b></p> <p><b>Dunaújváros - Centroport Ltd. Agricultural logistics terminal</b></p> <p>About the company:</p> <p>Ownership structure:</p> <ul style="list-style-type: none"> <li>• Stake in the enterprise of Port-Grain Ltd. : 51 %</li> <li>• Stake of GLENCORE Netherlands B.V. : 49 %</li> </ul> <p>Number of employees: 4 people</p> <p>Activity: agricultural logistics</p> <p>Annual average turnover of 136,000 mto</p>	<p>to see a reaction to the problems.</p> <p>AKI continues as a research and knowledge centre with the most extensive agricultural economics databases and the most significant policy expertise in Hungary. The EU's agricultural policy for 2021 (2023) -2027 is extremely complex, requiring significantly more preparation on the part of the Member States than before, and imposing much stricter requirements on farmers. The success of the developments is still difficult to comment on due to the delays in announcing and evaluating tenders, the increase in investment costs (leakage of subsidies) and the scarcity of administrative databases that can be processed. A new element is the Farm 2 Fork and Biodiversity Strategy developed in the framework of the Green Deal, as well as the ambitious environmental goal system set out in them, which is still under discussion. The EU's aid policy, which was originally intended to be temporary, is made up of too many elements, it is unfocused and due to the considerable size of its budget, is forced to meet as many social interest groups as possible at the same time. In fact, there is no need for new elements, much more to cut back on "wild shoots".</p> <p>One of the world's largest grain trading companies, Glencore B.V. Holland and Port-Grain Ltd established Centroport Ltd, with a majority Port-Grain ownership and Port-Grain professional management. The investment started in February 2000 and cost HUF 300 million, which the company provided from its own resources. At quay 6 of the Dunaújváros port, there is a 1,600 m2 covered flat storage space that can be divided into four cargo spaces by mobile separation walls, where 6,300 mto of bulk cargo can be stored at the same time. Loading and unloading and transshipment from road and / or rail and / or ship to road and / or rail and / or ship may take place. The ship does not need to be shifted; a bridge structure is moving on the wharf parallel to the ship and load the holds continuously. This element in the loading technology is a technical solution that is unique in the Hungarian port sector but is also at the forefront at the European level. The development has been carried out in a comprehensive approach, using state-of-the-art technological solutions, specifically to meet loading and storage needs. Owing to careful planning and quality implementation, the terminal can operate with low cost and high efficiency, at a much lower damage rate than the industry average. The experiences gathered here are worth applying in domestic and international practice as well.</p> <p>Recommendations:</p> <p>The experience of the last two decades shows that a moderate drought develops in Hungary every two years and a severe drought every three years. Therefore irrigation strategy has to be enforced.</p> <p>In the last century, the prevailing view has been that the supply of nutrients can be completely solved by using only fertilizers. This has worn out for our decade and is a thing of the past. In the future, the approach must change further, with the help of new, efficient fertilizers that also contain organic matter and other microelements.</p> <p>The basis of competitiveness and market thinking lies in the support and business structure that helps young farmers, in the</p>
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		<p>development of favorable credit schemes, and in the complex set of property policy and legislation.</p> <p>Development of ports belonging to the water TEN-T “network”, construction of its missing elements, modernization of cargo ships. Improving the parameters of ports not included in the water TEN-T “network” to reach the level of the core network to replace the missing background infrastructure, modernization of cargo ships.</p> <p>A goal is eliminating bottlenecks on the national railway network. Restoration of the original construction parameters supplemented by the most necessary development elements for the optimization of the railway operation and for the necessary increase of line and station capacity, travel-time savings and timetable stability.</p> <p>Improving the navigability of the Danube - The navigability of the Hungarian section of the Danube falls short of the expected level, which was especially true in 2018. At present, neither the fairway parameters set out in the AGN Agreement nor are the ones set out in the 2013 new Danube Commission recommendations met. The aim of the Hungarian TEN-T inland waterway development program (improving the navigability of the Danube) is aimed at developing a multimodal transport corridor that manages inland waterway transport and environmental and ecological objectives in a coordinated way, taking into account other socio-economic functions of the waterway.</p>
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## 8 ANNEX: Findings / Conclusions of Regional Workshop #1

Beside on existing information, stakeholder interviews and on expert expertise especially provided by WConsR supported by internal and external experts of the implementing PPs., the present Summary Report suppose to include as well the findings / conclusions arisen from an regional stakeholder working meeting on ports and agricultural ports traffic, having on the agenda certain discussions about the present situation with regards to the traffic of agricultural products on the Upper Danube Region. - Regional Workshop #1: Ports & Agricultural Products Traffic in the Danube Region Countries [DE/AT/SK].

As long as this workshop **did not take place until the date of completion of this report**, the report will be reviewed with these findings and conclusions and will be inserted in this annex at a later date.