



STUDIA OBSZARÓW WIEJSKICH
2020, volume 56, pp. 103-118
<https://doi.org/10.7163/SOW.56.4>



KOMISJA OBSZARÓW WIEJSKICH
POLSKIE TOWARZYSTWO GEOGRAFICZNE
www.ptgeo.org.pl



INSTYTUT GEOGRAFII I PRZESTRZENNEGO ZAGOSPODAROWANIA
POLSKA AKADEMIA NAUK
www.igjz.pan.pl



Transformation of agriculture in Czechia in the period 1990-2020

Antonín Vaishar  Milada Štátná 

Mendel University in Brno
Zemědělská 1, 61300 Brno, Czechia
antonin.vaishar@mendelu.cz • stastna@mendelu.cz

Abstract: This paper characterises the development of Czech agriculture in the 30 years since the change of political regime. It notes that, although ownership has changed, the structure of large farms has been maintained. There has been a reduction in livestock production in particular, which has disrupted the traditional relationship between the two principal agricultural activities. The number of workers in the primary sector has fallen very rapidly, to less than 6% now, even in rural areas. Therefore, the communities in the Czech countryside are no longer dependent on agriculture, whose role is increasingly shifting to landscape maintenance and non-productive activities. At present, subsidies under the EU's Common Agricultural Policy are the main driver in Czech agriculture. In the face of current challenges, attention needs to be paid to the environmental function of agriculture, while the impact of agricultural jobs on rural development is negligible.

Keywords: Czechia, agriculture, organisational structure, production, employment, Common Agricultural Policy.

Introduction

Czech agriculture has undergone significant and multifaceted transformation changes over the past 30 years. The most important of these was the transformation from productive to post-productive agriculture (Věžník et al. 2013). The changes of this kind – to be noted in all developed countries – are conditioned by technological progress, the relocation of a large part of production to the developing world, and overall social development. Other transformational trends are related to these changes. We can name globalisation (and in our conditions also Europeanisation) and the second demographic transition, but also global climate change.

The change from a centrally-planned system to the free market (and respectively from the communist to capitalist systems) meant significant shifts in the spheres of management, motivation, freedom of decision-making and associated responsibilities, and opened up space for experience and technology to be received from Western countries. These changes corrected some of the property injustices of the previous 40 years – although this process was never completed. However, the organisational structure of agricultural holdings has not changed much, and most of the technological changes have had very little to do with the political system.

Thirty years may be seen as a relatively long period, not least because it is – for example – half as much again as was available to the first Czechoslovak Republic (persisting

between 1918 and 1938), which is seen as having achieved considerable results, even in the face of a global economic crisis. It will therefore be appropriate to divide this recent period into several stages. For their part, Doucha and Divila (2008) identify five stages in the transformation of Czech agriculture. i.e. shock therapy (1990-1991), a liberal stage (1992-1993), restructuring (1995-1997), pre-CAP (1998-2003) and CAP implementation (2004-2005).

Here we shall see the first in terms of the immediate post-revolutionary period, which, in addition to the correction of property wrongs, was characterised by the search for „new“ ways of developing agriculture – often with a naive idea of family farms coming back and a rural idyll being restored. The second stage was then characterised by the involvement of Czech agriculture in the European framework, as culminating in the adoption of the Common Agricultural Policy (CAP), with its attendant benefits and problems. Our last stage is then characterised by a certain stabilisation of the sector under new conditions. Of course, this stabilisation cannot be definitive, as new challenges emerge constantly, not always as a consequence of socio-political developments. The COVID-19 pandemic is of course a supreme example, though in addition to that there is the long-term issue of global climate change.

The changes in agriculture have obviously impacted upon the development of the Czech countryside. Previously, (productive) agriculture was the main activity of the rural population, and the bearer of its tradition and wealth (or poverty). Today, agriculture is understood more as a multifunctional branch, the purpose of which is primarily the maintenance of the rural landscape to provide for consumption of an in the countryside (for which agriculture is partly responsible). The impact on social development in rural areas can be seen to have declined sharply.

This paper tries to describe and analyse the most important changes that have taken place in Czech agriculture and in the Czech countryside over the last 30 years. It will deal with ownership and organisational changes, agricultural production, non-productive functions of agriculture, the agricultural workforce, the impact of production on the environment and the like, in order to shed as comprehensive a light on the matter as possible.

Czech agriculture at the end of the centrally-planned period

As the era of the centrally-planned economy came to an end, the intensity of crop and animal production in Czechoslovakia was close to the level of developed countries in Western Europe and far exceeded world averages (Bičík and Jančák 2005). Czech agriculture was about 97% “socialised”, meaning that almost all agricultural enterprises were either state-run (State Farms, military, educational and other farms belonging to state organisations) or cooperative. Private farmers remained only in mountainous locations, where “socialisation” did not pay off. Such an ownership and organisational structure is unparalleled in any post-communist CEEC, with the exception of the USSR itself. In addition, agricultural holdings were extremely concentrated, to the extent that in many cases they included the land-registry territory of a larger number of municipalities and their management had to be multi-level.

Agricultural production was strongly focused on ensuring the quantitative food self-sufficiency of Czechoslovakia and other countries of the communist camp, while the qu-

alitative aspect was less significant. Large fields of arable land, reaching up to hundreds of hectares, were typical for the Czech agricultural landscape. This was also related to large volumes of chemicals being used in agriculture, as well as heavy machinery. All of this has had a detrimental effect reducing the quality of the rural environment, and indeed that of the whole country, with problems including groundwater and surface-water pollution, erosion, degradation of agricultural land, loss of biodiversity and the like.

The social impact of agricultural holdings on rural development was high. Unlike the public administration of rural municipalities, which was reduced more or less to a leveraging of top-down management, agricultural holdings had real economic power – not only financial assets, but also buildings, machinery and equipment that could be involved in rural development. Whilst village infrastructures and civic amenities remained relatively poorly developed because of the limits set on local-authority funding (and in this sense suffered from under-investment), there was considerable public investment in the Co-operative (in both farming and non-farming activities), and significant private investment in housing (Swain 1999). The salaries of agricultural workers, including benefits in kind, were interesting. Multilevel management of large agricultural enterprises required the participation of university-educated professionals, not only in production fields, but also in economics and management. In this way, the educational structure of the countryside increased.

Extensive associated industrial production created jobs in rural areas, diversified production, kept workers out of the main agricultural season, and contributed to supplying the market with food, electrical, metal, and woodworking goods (including computer and biochemical products), and also provided construction services. In some extreme cases, the non-agricultural production generated up to 90% of the gross production in agricultural businesses. That is why about 7% of economically-active people were statistically employed in agriculture at the end of the 1980s. Bičík and Jančák (2005) estimate that about half of these people were in fact employed in non-agricultural activities of the agricultural companies. This fact demonstrates the greater influence of agricultural holdings on rural development than would correspond directly with agricultural production.

However, oversized farms and a focus on quantity have begun to move to the brink of sustainability. The development of agricultural technologies has more or less relied on domestic research and industry. Although Czechoslovakia was somehow at the forefront among Europe's communist states, it was still falling steadily behind Western technologies. As a result of the transition to a post-productive society, work in agriculture seemed less attractive, especially for the younger generation. Motivation to work decreased. The biggest problem, however, was with central control. The process of controlling large agricultural enterprises, with limited possibilities for change and independent decision-making, was bound to be marked by degeneration (Majerová 2000).

Transformation of ownership and organisational structure

The first task of the post-communist transformation was to achieve ownership changes in the means of production in agriculture and the necessary organisational changes in agricultural holdings. In Czechoslovakia, restitution was a highly-politicised issue. Post-communist politicians tended to present the former era as an aberration – 40 years to be

simply written off. Yet complete restitution seemed (to Prague-based politicians in particular) the only politically acceptable form that any settling of accounts with historical injustice could take; and complete restitution was required, wherever possible restitution at full value and in the actual form of the object lost (Swain 1999).

It should be noted that the ownership of the land in question was founded in the land reform of 1919 and its revision after World War II, which in the final state meant the subdivision of large estates over 50 ha. The land left behind by displaced Germans¹ was distributed among new settlers. These changes took place before the onset of communism in February 1948. Collectivisation formally preserved property, even though the individual owners could not dispose of the land involved freely. Therefore, in most cases, it was sufficient to fully restore the existing property rights of the owners after 1989. The property of the unified agricultural Cooperatives was to be divided according to the land and capital invested by the individual members in the Cooperative and the number of years worked there. Privatisation of state-owned farms proceeded in a similar fashion to that of industrial enterprises.

Other property that peasants handed over to Cooperatives (animals, machines, buildings) had usually been consumed during the 40 years under communism, so could not normally be returned directly. A political and bureaucratic battle therefore broke out around the issue of compensation. For example, transformed farms often claimed that they were not the legal successors of the original Cooperatives, and were not therefore under an obligation to return property. At the central level, ideology played a major role, stigmatising everybody linked to the old system as favouring the position of the restituted. On the local level, the determinants of the distributive bargaining approach have been most important: asymmetries in exit options, time preferences and information have been striking, largely favouring persons from within the old management (Schlüter 2000). Thus fair compensation to peasants for property handed over is an issue that has never been resolved in a fully satisfactory way.

There have been some problems with land accessibility. Under communism, the division, merging, distribution and use of land took place in terms of the interest of users, not owners. Therefore, after their return to the original owners, some pieces of lands found themselves in the middles of fields lacking access. Field roads and borders had disappeared in the interim period. These situations are gradually being put right by way of land consolidation (Moravcová et al. 2017), a further aim being to digitise the registration of land.

The naive assumptions that Czechoslovak agriculture would return to the era of family farms were only partially confirmed. According to Nešpor (2006), the main problem of Czech agriculture is the absence of family-type farms rooted in their local community, and there is only limited potential for anything of this kind to develop. Small plots of less than 50 ha would hardly be in a position to compete. Furthermore, over 40 years, owners have mostly lost touch with land that has ceased to be a major source of wealth. Their children usually worked in cities in industry or services, and had no connection with agri-

¹ After the Second World War, the property of Germans, Hungarians, collaborators and traitors, including land, was confiscated on the basis of Decrees issued by the President of the Republic. Ethnic Germans were then displaced to the American and Soviet occupation zones of Germany, on the basis of the Potsdam Agreements. Their number is an estimated 2.5 million. Their land was found mainly in the areas of borderland with Germany, Poland and Austria, in large cities and some inland enclaves.

culture. Returns to family farms were often not even possible, as land often lay amidst fields surrounded by the land owned by large enterprises. Farm buildings near country houses have disappeared or been rebuilt for other purposes in 40 years. Today, individuals only farm about a quarter of the land.

The result of all this has more or less been the preservation of the structure of large companies from the communist era. The original unified agricultural Cooperatives were transformed into real cooperatives, joint stock companies, limited liability companies, trading companies and the like. These businesses farm largely on land leased from small owners. That explains how today's Czechia has by far the largest average area for agricultural holding companies in the European Union. These companies are often run as if they were in industry, with employees on contracts of employment. The result is that work in agriculture is no longer the meaning in a person's life, but a job like any other.

Notwithstanding a parcelling-off of ownership, whereby the number of landowners has increased from 17.5 to 80 per 100 ha over the last 230 years (Sklenička et al. 2017), it is the large agricultural holdings that predominate when it comes to the organisation of production. Even the average size of the farm run by a natural person is of 40 hectares. Table 1 shows that, from the point of view of ownership, four types of owners predominate in Czech agriculture, with each owning comparable areas of agricultural land and employing similar numbers of workers. Natural-person holdings predominate, but cover the smallest average areas. Natural persons also farm half of their own land, while legal entities use the vast majority of leased land. The male workforce predominates in all types of enterprises, but in the case of individuals this gender disparity is greatest. Limited liability companies represent a certain intermediate stage between natural-person companies and large holding companies. Their size is close to optimal, as is illustrated by the highest level of productivity per hectare. On average it is Cooperatives and joint stock companies that have the highest acreage of agricultural land, as mostly leased from small owners.

Holdings of size class X and larger (i.e. with an annual standard gross production of EUR 500,000 and more) account for 66% of the total area of agricultural land and 76% of farmed animals.

Table 1. Organisational structure of Czech agriculture, 2016

Legal form	Number	Area (ha)	Area per holding (ha)	Of its own* (%)	Employees	Employees per 100 ha	Women (%)
Physical persons	23,402	945,869	40	50.2	29,042	3.07	26.1
Cooperatives	502	668,104	1331	13.5	20,027	3.00	31.0
Joint stock companies	621	862,945	1390	18.1	26,742	3.10	32.7
Limited companies	1,836	839,877	457	22.7	21,176	2.52	32.2
Total	26,525	3,458,646	130	28.0	103,266	2.99	30.6

*own land from the total area of cultivated land

Source: authors' own elaboration based on Čermáková and Mácová (2016).

Post-productive transformation

Post-productive agriculture can be conceptualised as non-commodity production. Almsted et al. (2014) propose to alternatively evaluate the development of agriculture towards post-productivism through multi-functionality. Brouder, Karlsson and Lundmark (2015) measure this multi-functionality using hyper-production, which they define as *long-term output gains per worker in small and medium-sized holdings in the rural economy*.

Although the transition to a market economy loosened the barriers by which central planning hampered the transition to a post-productive economy, germs of this induced by technological change, were already evident while the communist regime was still in place. There are certain general features of the transition of agriculture from the productive to the post-productive phase (Robinson 2004). Their common denominator would be the loss of the central position of agriculture in rural society. The rural idyll is changing its notion. Rural is increasingly separating from agricultural. The emphasis on agricultural production is changing to one involving consumption of the countryside. Together with this, the stress on national self-sufficiency in agricultural commodities is being lost. Agriculture is shifting into sustainable mode.

A striking indication of the reduced importance of agriculture in the rural social system is provided by the sector's declining share of employees. The overall development is to be seen in Fig. 1. In the first period through to 1995, this was mainly a statistical decline caused by the separation of non-agricultural activities from agricultural holdings, and the removal of unnecessary jobs. Only a very limited number of holdings have maintained non-agricultural activities at the same level as before 1989 (Eretová and Jančák 2016). The further decline was partly due to a reduction in livestock production. At the same time, the consequences of increasing labour productivity were evident. As of 2019, 2.3% of economically active persons were working in agriculture and forestry.

The employment of the rural population in agriculture was always important for the rural social system. However, at the time of the 2011 census, less than 6.5% of economically active persons in municipalities with less than 2000 inhabitants were shown to be working in agriculture and forestry. If we add to this the fact that more than 70% of these people are employees of large holding companies, the share of classical farmers in the

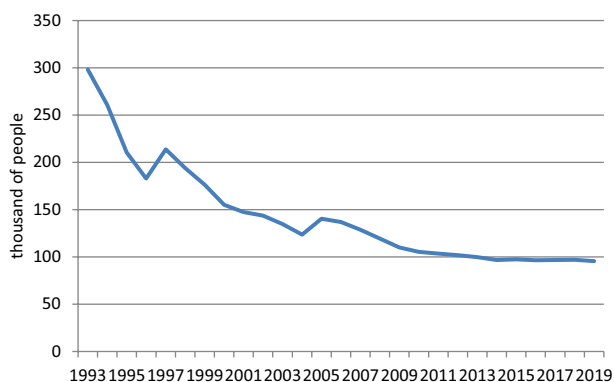


Fig. 1. The number of people engaged in agriculture and forestry in Czechia
Source: authors' own elaboration based on Public Database. Czech Statistical Office (1993-2019).

Czech countryside can be estimated at a mere 2%. What is more, this share is likely to decline slightly further. It is therefore clear that support for small farmers cannot in any way affect the rural labour market significantly, and nor can it stem the eventual depopulation of the countryside to cities in the few micro-regions where this occurs.

In general, rural tourism is expected to reflect the transition from production to rural consumption, with agri-tourism playing an important role (e.g. Dax et al. 2019). Although the Czech countryside is attractive for soft tourism², it suffers from underdeveloped infrastructure, insufficient promotion, insignificant cooperation of providers in individual micro-regions and a lack of a tradition of serving tourists.

Although the Ministry of Agriculture offers support and certification programmes for agri-tourism, this type is not very frequent. The problem posed to its development lies in the small number of family farms – as the typical providers of this form. In the Czech context, agri-tourism still does not count as a business venture deemed to contribute fundamentally to the revitalisation of rural space (Konečný 2014).

If there is a connection between tourism and agriculture, it is sometimes the other way around – namely that the primary activity is tourism, to which is added, for example, the breeding of animals (ostriches, buffalo or crocodiles) that can serve as an attraction, but also even represent a source of atypical meat. Other food-and-beverage activity might be added, for example the brewing of a venue's own beer. The capacity of such facilities then reaches about 40 beds, making it possible to accommodate a whole tourist bus. Hipo-tourism and wine tourism are also attractive, and here the offer is more about rural tourism than agri-tourism. But as of 2011, only 2.8% of the economically-active rural population was employed in the sector revolving around accommodation, food and beverages.

The main manifestation of rural consumption in the Czech Republic would in fact seem to be, not tourism, but first- and second-home housing. As of 2011, 26.7% of the Czech population lived permanently in municipalities with a population of up to 2000. This share has in fact been growing slowly but steadily since the mid-1990s. Perhaps remarkably, about two-thirds of rural municipalities in this country are experiencing migratory population growth. Furthermore, these are not solely suburbanised settlements (even though the increase is of course greatest there), but also rural settlements of other profiles, including localities that can be described as peripheral. Where rural declines in population are to be noted, they are recorded more in rural communities affected by structural changes, or in very isolated locations.

As of 2011, there were a total of 131,983 unoccupied dwellings serving recreational purposes in Czech municipalities with a population of up to 2000. This represents 13% of the housing stock. The number of cottages was 214,465 (Kubeš 2011). In total, the number of first and second dwellings in the Czech countryside is 1.3 million (as compared with a total of 2.8 million for urban flats). The prices of second homes are rising rapidly, especially in connection with the COVID-19 epidemic, which has impacted markedly upon domestic recreation. It follows that housing is the real consumer of the Czech countryside.

Productive agriculture is often associated with negative environmental impacts. The first transformation steps brought a reduction in the intensity of use of chemicals, be these fertilisers, pesticides or herbicides. However, this trend was conditioned, not so much by environmental awareness as economically. An end was put to the introduction of large

² Soft tourism is part of sustainable tourism and is the opposite of mass tourism. It has an environmental, social and economic dimension.

volumes of industrial fertilisers into unsuitable soils, where they could no longer have the effect of increasing production). The trend was soon reversed (Fig. 2), and a trade-off between environmental sustainability and economic performance is first and foremost present in different categories of farming specialisation. Two extremes might therefore be identified, i.e. intensive field cropping with high economic performance and low environmental sustainability, as well as (at the other end of the scale), extensive cattle-farming displaying worse economic performance but a high level of environmental sustainability (Špička et al. 2020).

Sustainable agriculture is linked to organic farming, social farming and similar trends. In the context of the 2016 Structural Survey in Agriculture (Czech Statistical Office), there were found to be 2984 organic farms in the Czech Republic, of which 462 engaged in crop production and 2521 in mixed production. These enterprises managed 448,228 ha of agricultural land, of which 57,350 ha was arable. More than 14% of agricultural land is under organic farming, which means twice the EU average (EUROSTAT). Organic farming is located mainly in the foothills, with an extensive form of production; and is largely focused on livestock. Compared with the situation at the turn of the millennium, organic farms now cover around seven times as much land as they did. Śpiewak (2016) attaches, not only economic importance to organic farming, but also a relevance when it comes to the social resources of rural communities being mobilised.

Contemporary Czech agriculture

As agriculture in the totalitarian period was a major recipient of redistributed funds, a certain resemblance to the situation with EU agricultural policy might be noted. However, the transition period between the change of regime and the preparation for accession to the EU saw this redistribution cease almost entirely, such that Czechoslovak agriculture was opened up to the international market economy in essence without any protection. The price shock after 1990 led to a sharp decline in food consumption. At the same time, there was a decline in the ability of countries to which food had been exported in the communist era to pay for their supplies. Investments in intensification from the final period under

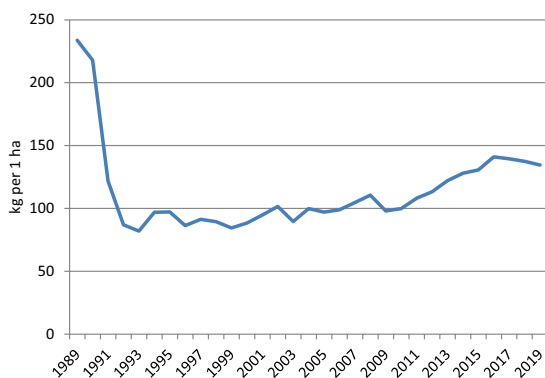


Fig. 2. Industrial fertilisers – consumption of pure nutrients (kg per ha) of agricultural land
Source: authors' own elaboration based on Public Database. Czech Statistical Office (1989-2019).

communism did not suffice to return parts of the reduced production to agricultural holdings. At the same time, the latter were burdened by the costs of transformation. Such harsh conditions ensured that only some farms could survive, and these were mostly the ones betting in time on innovative trends with high labour productivity. Part of this trend has involved a reduction in livestock production, which is significantly more labour-intensive. Nevertheless, the intensity of agricultural production decreased (Fig. 3).

The graphics present the overall 30% decline in gross agricultural output. Virtually all of that is related to animal production, which decreased by 40%. The effect of this was for crop production – significantly lower at the beginning of the period under review – came to equal livestock production around 2005, and is currently increasing steadily. In addition to bringing about a reduction in numbers of agricultural workers, this development had a negative impact on the role manure was able to play in farming. It necessitated enhanced use of the artificial fertilisers whose environmental consequences are familiar enough.

The development of harvests of the most important crops has been as shown in Fig. 4. Both the potato and sugar-beet harvests have declined, while the aforesaid reduced livestock production has obviously linked with lower planting and harvesting of fodder crops on arable land. In contrast, harvests of both rape and maize increased, even as there was a decline in the harvest of cereals other than wheat (i.e. barley, rye and oats).

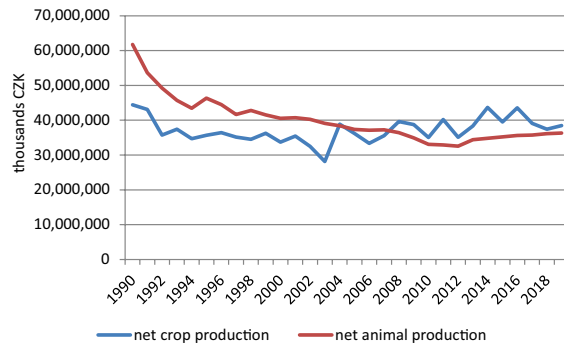


Fig. 3. Net agricultural production at constant 1989 prices

Source: authors' own elaboration based on the Public Database of the Czech Statistical Office (1990-2019).

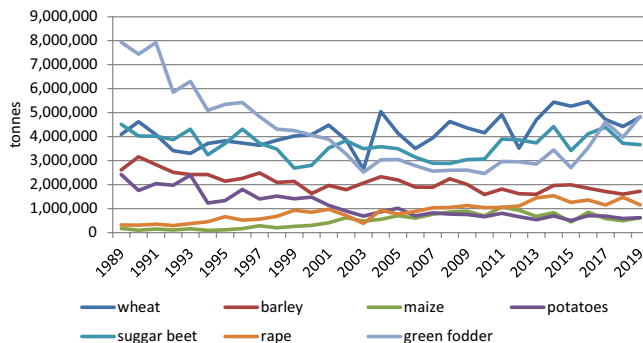


Fig. 4. Harvests of the most important crops 1989-2019

Source: authors' own elaboration based on the Public Database of the Czech Statistical Office Praha (1989-2019).

Fig. 5 confirms decreases in the dimensions characterising the breeding of both main livestock animals. At first, it was cattle-breeding activity that fell sharply, only later to be followed by a similar decline in pig farming, probably reflecting reduced demand for pork as many people transitioned to a “healthier” diet. Sheep farming has in fact increased, but remains marginal. Horses serve more in the role of attractions, in connection with the development of tourism in general and hipotourism in particular. Although poultry farming (Fig. 6) also declined initially, the sustained trend more recently has been somewhat upward. Despite significant support under the CAP, the group of farms seen to be most threatened are those grazing livestock in areas facing natural constraints (Hlavsa et al. 2020).

Shifts in agricultural production are also reflected in the structure characterising land use (Fig. 7). While the area of forest remains more or less stable, arable land is becoming more damped, while the area of permanent grassland is growing as a result of greening. Interesting changes are taking place in landscape microstructures. The communist era was characterised by the ploughing of borders, the consolidation of fields and the creation of large monoculture fields, to optimise possibilities for heavy machinery to be used. This policy had its environmental consequences in the form of increased erosion

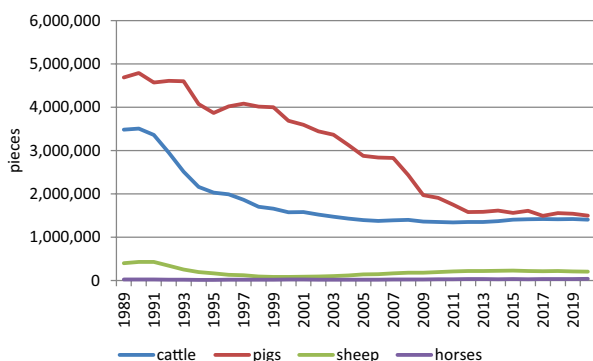


Fig. 5. Development of livestock production 1989-2020

Source: authors' own elaboration based on the Public Database of the Czech Statistical Office (1989-2020).

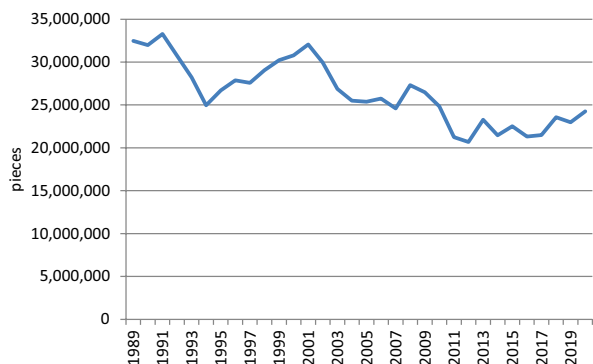


Fig. 6. Change in number of the different poultry species reared in the Czech Republic 1989-2020

Source: authors' own elaboration based on the Public Database of the Czech Statistical Office (1989-2020).

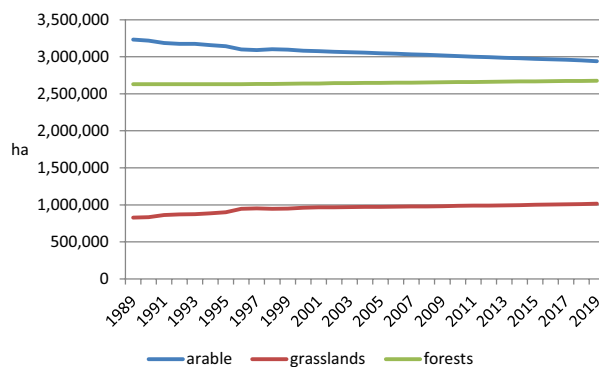


Fig. 7. Development of land use

Source: authors' own elaboration based on the Public Database of the Czech Statistical Office (1989-2020).

and reduced biodiversity. Moreover, field sizes did not decrease significantly following the regime change, with the result that relevant legislative measures have been necessitated in the most recent period.

In the vicinity of large cities in particular, there has been conversion of agricultural (above all arable) land into built-up or other areas. In and of itself the loss of this land need not be negative. However, problems are that, on the one hand, the land that was built up in this way often featured some of the most fertile soils, and on the other that the land's capacity to retain water is curtailed in this way, a problem given the risk of drought. Less-significant changes then include the increase in the area of vineyards, especially in southern Moravia just before 2004, when the Czech Republic joined the EU.

One of the alternatives to agriculture is the production of energy from renewable plant and animal sources using biogas, or the supplementing of conventional fuels with vegetable oils. The processing of biomass and agricultural waste to produce energy is a more labour-intensive endeavour (Dvořák et al. 2017). It can therefore create (maintain) jobs in problem regions, even as it is inefficient both economically and spatially, and must therefore be subsidised. According to the Czech Statistical Office, 2119 GWh of electricity were produced from biomass and 2607 GWh from biogas in 2018, which represents 5.4% of bio-energy within overall energy production. During the same period, 95,231 TJ of heat from biomass and 4141 TJ of heat from biogas were produced.

The subsidy policy has changed considerably. At the end of the socialist period, subsidies were directed to a levelling of economic results of companies operating under different natural conditions. Businesses operating in favourable conditions paid land tax, while companies operating in unfavourable ones received subsidies. The purpose of this transfer was to somehow balance the social conditions experienced by farmers in different regions. However, in practice this system had a negative effect, both economically (because subsidies far exceed taxes) and ecologically (because intensive production was maintained even in unsuitable conditions).

This subsidy system was abandoned in 1991, with all that remained being support for agricultural management in a limited number of extremely disadvantaged locations or in protected areas. Subsidies were largely shifted to supporting non-production activities aimed at certain kinds of landscape being maintained. They were mostly granted as gu-

aranteed loans to banks or as financial assistance repaying interest on amounts due. The situation changed in the run-up to EU accession. Then, support was implemented under the European programmes known as SAPARD, PHARE and ISPA.

The EU's Common Agricultural Policy (CAP) is the oldest and most expensive Community policy. During its existence since 1957, it has undergone complex development. Currently, the programme for the period 2014-2020 is coming to an end. From the point of view of the Czech Republic, political discussions taking place stressed in particular the issue of direct payments being capped. This reflects Czechia having by far the highest average area per agricultural holding (Fig. 8) – even if this is declining here (while increasing in other EU countries). Overall, some 92.5% of agricultural land is managed by agricultural holdings covering more than 50 ha, with this being the highest figure in Europe ahead of Slovakia.

There is no doubt that the CAP is currently having a decisive influence on the development of Czech agriculture. Investment support to Czech farms as grants under Measure 4.1.1. (Investment to agricultural holdings) of the Rural Development Programme 2014-2020 represents about 70% of all that reaching farms (Doucha et al. 2017). Today's CAP is associated with multi-functional agriculture (Hrabák et al. 2019). The regional cross-section shows that this (which is taken to include organic farming, agri-tourism or phyto-energy production) is mainly being pursued in mountain and foothill areas (Hrabák and Konečný 2017), while traditional lowland areas of intensive agriculture are still mainly focused on production as such.

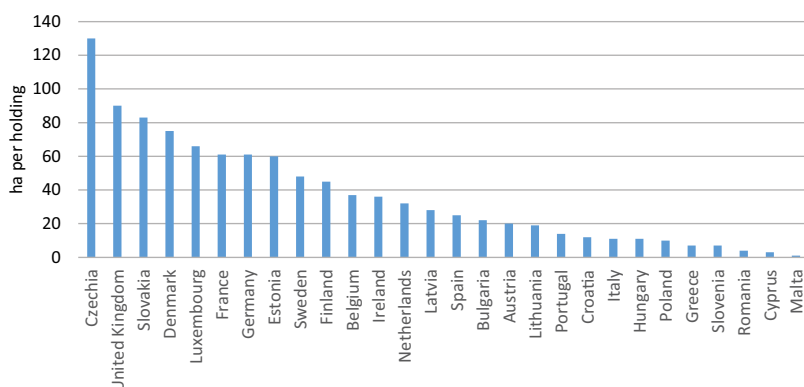


Fig. 8. Average area of an agricultural holding in different EU Member States

Source: authors' own elaboration based on Farm indicators by agricultural area, type of farm, standard output, legal form and NUTS 2 regions (Eurostat).

Agriculture and rural development

As already mentioned, the needs of agriculture and the countryside diverge in the context of post-productive development. Main drivers of the Czech countryside's development were described by Vaishar and Štastná (2019). We consider that the basic issue of rural development in this period has not been support for agriculture, but rather support for the development of human and social capital in rural areas.

Human capital (conceived as level of education) is significantly lower in rural areas than in cities. In fact, it is probably the main differentiating factor that affects the quality of life and living standards of the rural population. At the same time, the so-called rural skills of the peasants of old are disappearing gradually. The main motivating factor for emigration from rural settlements is not the lack of job opportunities, but the effort to achieve higher education and a richer social life.

Promoting job creation in agriculture or rural tourism cannot solve this problem. Rather, the solution lies in improving rural life, caring for infrastructure and, in particular, digitising the countryside (Wilson and Hopkins 2019). The latter process will make life easier for residents, and make it possible for them to work from home. Under these conditions, even better-educated people can settle in the countryside, taking advantage of such attractive attributes as landscape, the environment and social relations.

Rural social capital used to be based on the fact that the inhabitants of individual villages knew each other personally and were able to help each other. Today's rural inhabitants represent a mixture of people living and working in the place, people commuting to work and owners of second homes. This fact has weakened the cohesion among villagers, though this still remains stronger than in the cities. When it comes to cooperation within wider micro-regions, individual entities cooperate on the basis of voluntary associations of municipalities, or by way of the LEADER method (Hoffmann and Hoffmann 2013)

New challenges

Climate change, in particular drought, poses a serious challenge for European agriculture (Fellmann et al. 2017). This is due, not only to reduced rainfall, but also to the expected extension of the growing season, which consumes more moisture. In Czech conditions, it is also about the ability of the soil to retain water. Due to the use of heavy machinery and the limitation on deep-ploughing, soil is compacted and not therefore able to absorb enough water. This is approached by the occupation of agricultural land for construction, and its strengthening with asphalt or concrete. Water that cannot soak up increases the risk of floods in the event of heavy rain. On the other hand, prolonged drought is a second consequence that can increase the risk of fire.

Of course, the new EU CAP also represents a challenge. Post-2020 the direction proclaimed for the Policy is one more about coping with the environmental challenges of climate change, biodiversity loss and so on. Despite certain positive measures, this further-reformed CAP is perceived as insufficient by some (e.g. Heyl et al. 2020), and as unconvincing (Sumrada et al. 2020). Along with certain others, Gohin and Zheng (2020) are likewise of the opinion that European policymakers should ensure well-functioning risk-contingent markets, rather than maintaining rigid intervention-price levels. The sustainability of agriculture should be achieved without jeopardising Europe's food security (Scherer et al. 2018). This probably presupposes regional differentiation of agricultural production, in line with natural resources and environmental threats.

Agriculture operates under conditions of uncertainty. As a rule, this means the uncertainty of meteorological conditions, natural or ecological disasters, or fluctuations in world markets for food and other agricultural products. Recently, however, it is the

consequences of the COVID19 pandemic (Kluba et al. 2020) that have become apparent, even as their full impact remains to be assessed.

Conclusions

In the past thirty years, Czech agriculture has undergone significant changes, which have manifested themselves in both ownership relations and the organisation of production, as well as in technologies applied. The main goal of agriculture is also changing – from food production to landscape maintenance. The importance of agricultural employment for rural development has declined significantly. Nevertheless, Czech agriculture in particular (but also that in the CEECs in general) faces further challenges, whose impacts and solutions will need to be monitored.

Acknowledgement

Publication prepared under the research projects of the National Science Centre, no. UMO-2016/23/B/HS4/00421, Models of agriculture transformation in the countries of Central and Eastern Europe after the fall of the Eastern Bloc – review of achievements, determinants and development scenarios.

References

- Almsted, Å., Brouder, P., Karlsson, S., Lundmark, L. (2014). Beyond post-productivism: From rural policy discourse to rural diversity. *European Countryside*, 6(4), 297-306. <https://doi.org/10.2478/euco-2014-0016>
- Bičík, I., Jančák, V. (2005). *Transformační procesy v českém zemědělství*. Praha: Karlova Univerzita.
- Brouder, P., Karlsson, S., Lundmark, L. (2015). Hyper-production: a new metrics of multi-functionality. *European Countryside*, 7(3), 134-143. <https://doi.org/10.1515/euco-2015-0009>
- Čermáková, K., Máčová, M. (2016). *Strukturální šetření v zemědělství*. Praha: Český statistický úřad.
- Dax, T., Zhang, D.C., Chen, Y.Y. (2019). Agritourism Initiatives in the Context of Continuous Out-Migration: Comparative Perspectives for the Alps and Chinese Mountain Regions. *Sustainability*, 16(11). No.4418. <https://doi.org/10.3390/su11164418>
- Doucha, T., Divila, E. (2008). Changes in the Czech agriculture in the years 1990-2008. In: J. Bański, M. Bednarek (eds), *Contemporary Changes of Agriculture in East-Central Europe* (p. 73-96). Warszawa: IGiPZ PAN.
- Doucha, T., Pechrová, M., Chaloupka, O., Medonos, T. (2017). Investment supports to the Czech farms and their expected future under the CAP 2020+. In: K. Wigler, A. Kowalski, (eds), *Strategies for the Agri-food Sector and Rural Areas – Dilemmas of Development* (p. 85-95). Warszawa: Institute of Agricultural and Food Economics.
- Dvořák, P., Martinát, S., van der Horst, D., Frantál, B., Turečková, K. (2017). Renewable energy investment and job creation; a cross-sectoral assessment for the Czech Republic with reference to EU benchmarks. *Renewable and Sustainable Energy Reviews*, 69, 360-368. <https://doi.org/10.1016/j.rser.2016.11.158>

- Eretová, V., Jančák, V. (2016). The past, present and future of diversification of agricultural holdings in Czechia. *Acta Universitatis Carolinae Geographica*, 52(1), 27-37.
<https://doi.org/10.14712/23361980.2017.3>
- Farm indicators by agricultural area, type of farm, standard output, legal form and NUTS 2 regions. Eurostat. Last update 07.02.2020.
- Fellmann, T., Witzke, P., Weiss, F., van Doorslaer, B., Drabik, D., Huck, I., Salputra, G., Jansson, T., Leip, A. (2018). Major challenges of integrating agriculture into climate change mitigation policy frameworks. *Mitigation and Adaptation Strategies for Global Change*, 23, 451-468.
<https://doi.org/10.1007/s11027-017-9743-2>
- Gohin, A., Zheng, Y. (2020). Reforming the European Common Agricultural Policy: from price and income support to risk management. *Journal of Policy Modelling*, 42(3), 712-727.
<https://doi.org/10.1016/j.jpolmod.2020.02.008>
- Heyl, K., Doering, T., Garske, B., Stubenrauch, J., Ekaradt, F. (2020). The Common Agricultural Policy beyond 2020: a critical review in light of global environmental goals. *Review of European Comparative and International Environmental Law*. <https://doi.org/10.1111/reel.12351>
- Hlavsa, T., Špička, J., Štolbová, M., Hloušková, Z. (2020). Statistical analysis of economic viability of farms operating in Czech areas facing natural constraints. *Agricultural Economics*, 66(5), 193-202. <https://doi.org/10.17221/327/2019-AGRICECON>
- Hoffmann, R., Hoffmann, N. (2018). The LEADER programme as an impulse for new projects in rural areas. *Quaestiones Geographicae*, 37(2), 141-150. <https://doi.org/10.2478/quageo-2018-0014>
- Hrabák, J., Jančák, V., Eretová, V. (2019). The agriculture in Czechia after EU entry: focus on multifunctional agriculture based on non-commodity production. In: J. Baňski (ed.), *Three Decades of Transformation in the East-Central European Countryside* (pp. 55-71). Cham: Springer, https://doi.org/10.1007/978-3-030-21237-7_15
- Hrabák, J., Konečný, O. (2017). Multifunctional agriculture as an integral part of rural development: Spatial concentration and distribution in Czechia. *Norsk Geografisk Tidsskrift*, 72(5), 257-272. <https://doi.org/10.1080/00291951.2018.1532967>
- Kluba, J., Szczepańska, B., Uss-Lik, A. (2020). The coronavirus pandemic as a new challenge in agriculture in the opinion of Polish farmers. In: J. Zapletalová, A. Vaishar (eds.), *Smart countryside for the 21st century* (p. 24-25). Brno: Mendel University.
- Konečný, O. (2014). Geographical perspectives on agritourism in the Czech Republic. *Moravian Geographical Reports*, 22(1), 15-23. <https://doi.org/10.2478/mgr-2014-0002>
- Kubeš, J. (2011). Chatové oblasti České republiky. *Geografický časopis*, 63(1), 53-68.
- Majerová, V. (2000). Four milestones in the social and economic development of Czech agriculture. *Czech Sociological Review*, 8(2), 157-176.
- Moravcová, J., Koupilová, M., Pavlíček, T., Zemek, F., Kvítek, T., Pečenka, J. (2017). Analysis of land consolidation projects and their impact on land use change, landscape structure, and agricultural land resource protection: case studies of Pilsen-South and Pilsen-North (Czech Republic). *Landscape and Ecological Engineering*, 13, 1-13. <https://doi.org/10.1007/s11355-015-0286-y>
- Nešpor, Z.R. (2006). The son has ploughed, but a foreign son. Five case studies of transformation strategies in Czech agriculture after 1989. *Czech Sociological Review*, 42(6), 1171-1194.
- Public database. Praha: Czech Statistical Office. Retrieved from <https://vdb.czso.cz/vdbvo2/faces/en/index.jsf>.
- Robinson, G. (2004). *Geographies of Agriculture. Globalization, Restructuring and Sustainability*. Harlow: Pearson.

- Scherer, L.A., Verburg, P.H., Schulp, C.J.E. (2018). Opportunities for sustainable intensification in European agriculture. *Global Environmental Change*, 48, 43-55. <https://doi.org/10.1016/j.gloenvcha.2017.11.009>
- Schlüter, A. (2000). Institutional change in transition: restitution, transformation and privatisation in the Czech agriculture. In *Institutional Change in Transition: Czech Republic* (p. 1-35). Osaka: Kato.
- Sklenička, P., Zouhar, J., Trpáková, I., Vlasák, J. (2017). Trends in land ownership fragmentation during the last 230 years in Czechia, and a projection of future development. *Land Use Policy*, 67, 640-651. <https://doi.org/10.1016/j.landusepol.2017.06.030>
- Sumrada, T., Lovec, M., Juvands, L., Rac, I., Erjavec, E. (2020). Fit for the task? Integration of biodiversity policy into the post-2020 Common Agricultural Policy: Illustration on the case of Slovenia. *Journal of Nature Conservation*, 54. <https://doi.org/10.1016/j.jnc.2020.125804>
- Swain, N. (1999). Agricultural restitution and co-operative transformation in the Czech Republic, Hungary and Slovakia. *Europe-Asia Studies*, 51(7), 1199-1219.
- Špička, J., VINTR, T., Aulová, R., Macháčková, J. (2020). Trade-off between the economic and environmental sustainability in Czech dual farm structure. *Agricultural Economics*, 66(6), 243-250. <https://doi.org/10.17221/390/2019-AGRICECON>
- Śpiewak, R. (2016). Multifunctionality of organic farming: Case study from southern Poland. *European Countryside*, 8(1), 1-15. <https://doi.org/10.1515/euco-2016-0001>
- Vaishar, A., Štátná, M. (2019). Development of the Czech countryside after 1990: Causes and consequences. In: J. Bański (ed.), *Three Decades of Transformation in the East-Central European Countryside* (p. 96-116). Cham: Springer, https://doi.org/10.1007/978-3-030-21237-7_5
- Věžník, A., Král, M., Svobodová, H. (2013). Agriculture of the Czech Republic in the 21st century: from production to the post-production. *Quaestiones Geographicae*, 32(4), 7-14. <https://doi.org/10.2478/quageo-2013-0029>
- Wilson, R., Hopkins, J. (2019). The Changing Shape of Scotland's Digital Divide. *European Countryside*, 11(4), 563-583. <https://doi.org/10.2478/euco-2019-0031>