

Industrial zones and their impact on society

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Abstract: Currently, we can see a rapid decline of agricultural land with new uses, especially for construction purposes. This negative trend is evident across Europe, the Czech Republic has the fastest loss of land in the EU. One reason for the significant loss of agricultural land is building industrial zones, which utilises of greenfield areas, and their occupying new areas of agricultural land, often the most the most fertile. The analysis deals with the occupied area (the area of a particular industrial zone), the percentage utilisation of that industrial zone, the number of employees in the industrial zone, and the land quality expressed by means of the agricultural land protection class. The results of the analysis show the low usability of industrial zones, the large occupation of the agricultural land, and the low benefits to the Czech state and Czech citizens. The results also show the poor land use policy in relation to the soil protection. This work is followed by the project Sustainable management of natural resources with an emphasis on non-production and production ability of the soil, the results of which will be included in legislation and be binding for spatial planning.

Keywords: agricultural land management; brownfield; land agriculture protection; land take; land use changes; soil sealing

The aim of this study is to evaluate the benefit of industrial zones for society in relation to the retention of water in the soil and soil conservation.

On the one hand, we have the interests of politicians, developers, and land speculators, whilst on the other, we have farmers, soil scientists and the wider

public, who are not indifferent to the occupation of agricultural land, but also to the permanent change in the landscape and the environment.

According to the Regional Information Server (Anonymous 2016), there are currently 147 zones in the Czech Republic, which is considerably higher

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than the demand. To support the development of not only industrial zones, there is a so-called “Business Support and Infrastructure Support Programme” issued by the Ministry of Industry and Trade in the Czech Republic (Anonymous 2007).

The main objective of this programme is to ensure the long-term sustainable development of the Czech Republic, and the necessary assumptions and conditions for the implementation of projects in the field of manufacturing industry, strategic services and technology centres, thus contributing to the strengthening of the economic and regional development by increasing the competitiveness of the investment environment especially in economically weak or structurally affected regions, thereby creating the prerequisites for the creation of new jobs.

The aims of the programme for supporting industrial zones are listed in Table 1.

In the Czech Republic, the soil is divided into five protection classes. In the 1st class of protection, the land is classified as the most valuable, removable only in exceptional cases, for public purposes, e.g., for constructions such as roads, motorways, and railway corridors.

Gradually, the degree of protection decreases, with the 3rd class nominated as average land, usable for construction, and the 5th grade of land is dispensable for agricultural purposes. These soil categories were based on the results of a Systematic Soil Survey and soil rating. It is, therefore, not a random classification or biased concept, but the incorporation of soils is comprehensively categorised according to the soil and climatic characteristics, as well as the economic characteristics for the entire territory. Work on the Systematic Soil Survey and soil rating took about 20 years, and the data is constantly being updated. The whole project is based on a collaboration of pedologists, climatologists, cartographers, economists, and agronomists. Before starting to build an industrial zone, a number of legislative acts must take place.

Above all, the change of the land-use plan, then the exclusion of land from the agricultural land fund, and payment of the set-aside levy (the amount is also stipulated by Act No. 334/1992 Coll.). Nevertheless, greenfield buildings are generally cheaper than brownfield revitalisation. For the investor, this procedure is often more appropriate with regard to the project: the investor is not restricted. Another motivation, for a long time, was the actual amount of the levies, which was based on the official price of the land from the time of the creation of the law, i.e., from 1992. Only later amendments, since 2007, have changed the calculation procedure, dramatically increased the levies, especially for land in protection categories 1 and 2, which naturally triggered criticisms from developers and the building lobby in general. Exceptions have been extended, where levies are not paid, so soil protection becomes even more questionable.

Literary research. A major problem of the Czech countryside is the large decrease in the amount of farmland in recent decades (Janků et al. 2016). An economic study (Needham et al. 2013) found that when a land-use plan is made that includes land for industrial uses, the amount of land reserved is usually based on an implicit theory that companies require land. As a result, it is not clear what the effects would be if the theory turns out to be incorrect. Where that substitution is difficult – such as for many firms using factories – the practical consequences could be serious. It follows that it is important to generously reserve such land. The results of a recent study (Lee & Brody 2018) indicate that urban built-up land with higher impervious surfaces and agricultural land may cause more flood damage than other land uses analysed in the study. It is a difficult task for the second group to convince the decision makers. It is not easy to defend against elementary arguments about the benefits of industrial zones. Discussions on the importance of preserving farmland do not appear

Table 1. Objectives of the programme to support industrial zones (Anonymous 2007)

Tracking parameter	Objectives of the programme in 2005–2030
Supported area of industrial zones total (ha)	2 023
of which the size of newly created areas of interest (ha)	1 129
of the areas prepared under the development of existing ones (ha)	894
The amount of direct investment in production and other investments (billion CZK)	71.489
No. of newly created jobs in 2030	29 053
Occupancy of industrial zones in 2030 (%)	70

Table 2. The soil groups in the Hradec Králové and Central Bohemian regions

Soil group	Region			
	Hradec Králové		Central Bohemian	
	representation (%)	acreage (ha)	representation (%)	acreage (ha)
Chernosols	8.19	22 644	19.9	129 128
Luvisols	24.92	68 847	15.28	99 587
Cambisols	15.48	42 752	31.29	204 033
The others	51.41	141 989	33.53	219 302
Total	100	276 232	100	652 050

to have worked thus far. Land-use transformations are influenced by multiple socioeconomic forces (Lambin & Meyfroidt 2010). Since World War II, European urban areas have expanded by 78%, while their population has increased by only 33% (European Environment Agency 2006). cities in Central and Eastern Europe experienced the highest rate of land consumption in Europe (2006–2012), (Salvati et al. 2018). The empirical results of studies indicate how different forms of urban expansion have distinctly influenced land-use changes and land consumption rates, according to place-specific factors (Salvati & Morelli 2014; Oueslati et al. 2015; Salvati & Carlucci 2016; Salvati et al. 2018). Since urbanisation has been one of the most pervasive drivers of land-use change, identifying pertinent socioeconomic factors is a key to understanding the land exploitation processes, and designing effective strategies for urban containment (Solon 2009; Grekousis et al. 2013; Zitti et al. 2015). Defining socioeconomic contexts resulting from different forms of urban expansion also improves the reliability and precision of land-use scenarios (Weilenmann et al. 2017). In the long term, a comparative assessment of urban expansion on a local scale in Europe appears to be a crucial basis to implement policies of urban containment and sustainable land-use management (Salvati et al. 2018).

METHODS

Data from three regions were used for this article. The Central Bohemian Region and Hradec Králové Region are among the areas with the highest quality of agricultural land. On the other hand, the Liberec Region is characterised by higher altitudes, worse climatic conditions and, hence, lower quality soils. This article analyses the available data to demonstrate the need for, and efficiency of, building industrial zones for the Czech state and Czech citizens.

Assessments were made in the area occupied (the industrial zone), the utilisation of the industrial zones, the number of employees, the number of Czech employees, and the land value expressed by the agricultural land protection class (category). Some data were very difficult to obtain, because some firms were not willing to make their information public – especially about the number of employees.

The most productive regions of Hradec Králové are covered by Chernosols and Luvisols in the districts of Hradec Králové and Jičín, and locally in the Rychnov area, as well as Cambisols in the southern and southwestern areas of the region. The most widespread reference class of soils in Central Bohemia are Cambisols, with Chernosols mainly found in drier areas. (IUSS Working Group WRB 2015). The soil groups in the regions are listed in Tables 2 and 3.

The program ArcGIS (Ver. 10.5, 2016) from ESRI was utilised for the creation of the mapping outputs. The data for working with ArcGIS were acquired from the Czech University of Life Sciences in Prague, the Research Institute for Soil and Water Conservation and the Association of Regional Czech Municipalities. The shapefiles of the soil types of ratio 1 : 250 000 and water retention capacities were measured. The Czech University of Life Sciences provided the data,

Table 3. The soil groups in the Liberec Region

Soil group	Liberec region	
	representation (%)	acreage (ha)
Chernosols	1	1 537
Luvisols	17	23 001
Cambisols + Podzols	34	46 651
Cambisols + Leptosols	10	13 584
Stagnosols + Gleysols	32	43 816
The others	6	8 053
Total	100	136 642

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as well as the Research Institute for Soil and Water Conservation, which gave the point layer of the brownfields for the Central Bohemia and Hradec Králové Region. The point layer of the brownfields in the Liberec region was provided by the Association of Regional Czech Municipalities and a polygon layer of plots of the Liberec Region. The shapefiles of the industrial zones were acquired from the Ministry of Regional Development. The other shapefiles were acquired from the ArcČR 500 databases of the Czech Republic.

The overview maps WRC (water retention capacity) and soil types with Brownfields were created by uploading the shapefiles to GIS; the layers were not modified.

For the map of the IZ (industrial zone) Kuřivody, the polygon map of the Liberec Region was used as the base map. A layer of industrial zones and brownfields was recorded on it, and the area of Kuřivody and the brownfield next to it were calculated in the GIS attribute table. The Kuřivody Industrial Zone shows the current situation of brownfields well and their use in the construction of industrial zones. A brownfield lies less than 0.5 km away from the Kuřivody zone, which has an area (73.52 ha) just as large as this industrial zone (75 ha).

Due to the scope of the article, we do not provide data for all the examined regions (the built-up area of quality soils, brownfields, and employment analysis).

RESULTS

To address the question of whether it is beneficial for society to further develop industrial zones or to place restrictions on the use of agricultural land, we focused on the following topics.

Size of industrial zones and protection classes of agricultural land resources. In the Liberec Region,

Table 4. Industrial zones and acreage of protection classes of agricultural land resources in the Hradec Králové region

Land character	Acreage (ha)	
Protection classes of agricultural land resources	I.	104.45
	II.	81.38
	III.	78.11
	IV.	59
	V.	66.94
Mostly building land	113.91	
Industrial zones total	503.79	

industrial zones occupy 467 ha, representing 0.15% of the total area of the region (316 339 ha). This may appear to be a very low percentage, but this area of industrial zones corresponds to 104 times the area of Wenceslas Square in Prague. In the Hradec Králové Region, it corresponds to 112 times the area of Wenceslas Square, and in the Central Bohemia Region, it corresponds to 330 times the area. Wenceslas Square is a 750 m long and 60 m wide boulevard in Prague (4.5 ha). In the Hradec Králové Region, more than half the industrial zones are implemented on soils classified in the 1st–3rd class of protection. The acreage for the individual classes is listed in Table 4 and Figure 1.

The effectiveness of the law in this regard remains, in particular, on paper. Territorial planning seems to protect the soil on the last place. Surely there are situations where it is not possible to comply with the letter of the law, but the high proportion of land being taken

in the 1st class of soil protection tends to show little interest in protecting soil and gives priority to other interests.

More than half of the industrial zones in the Liberec Region are implemented on land categorised as being

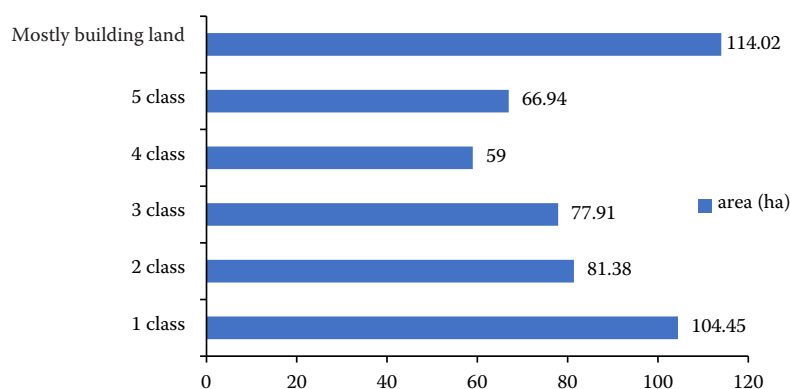


Figure 1. Industrial zones and the acreage of protection classes of agricultural land resources in the Hradec Králové region

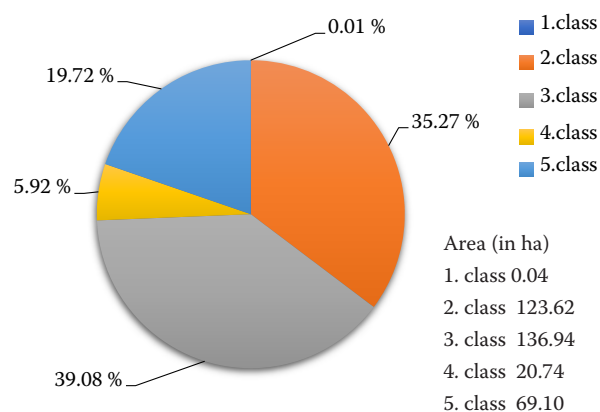


Figure 2. The soil protection classes in the industrial zones in the Liberec region

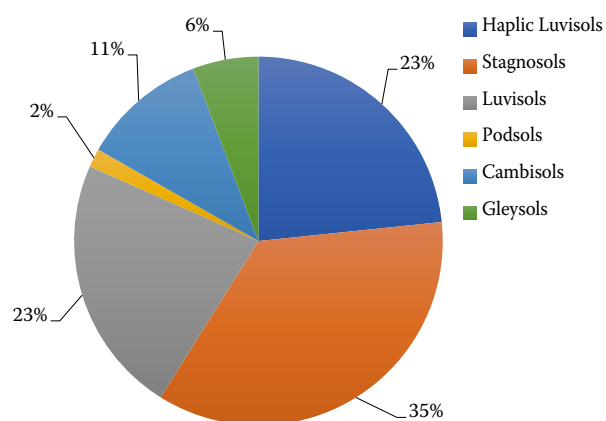


Figure 3. The soil types of the industrial zones in the Liberec region

in the 3rd–5th class of protection. Building industrial zones on the most fertile soils (1st–2nd class of protection) is not as significant here (see Figure 2). The reason may be the mountainous and sub-mountain type of landscape with worse climatic and soil conditions and, unfortunately, no soil protection. Almost half (46%) of the industrial zone areas are located on Luvisols, as can be seen in Figure 3.

Other land take is caused by lack of water, which is gradually becoming a rare commodity in some regions due to climatic changes and other factors. Soil-sealing and lack of water continues to increase. It has been assumed that the planned expansion of the Solnice-Kvasiny industrial zone

could endanger the large underground water resources vitally important to the Rychnov and Hradec Králové areas. Warehouses and other soil-sealing locations in the zone will prevent water absorption. However, the project has had almost total unconditional support.

Figures 4, 5, 6 and 7 show the retention of the water capacity in the examined regions (Žalud et al. 2019). The industrial zones and brownfields are also indicated here.

The water retention capacity was determined by Kopecký cylinders. The fully saturated sample was aspirated for 24 h on filter paper and the observed humidity corresponded to the water holding capacity

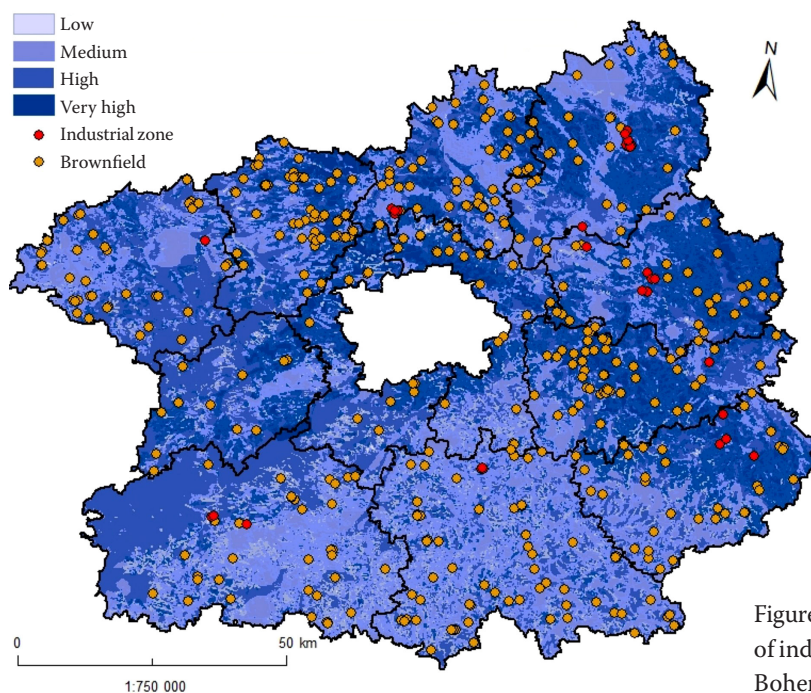


Figure 4. The water retention capacity and location of industrial zones and brownfields in the Central Bohemian region

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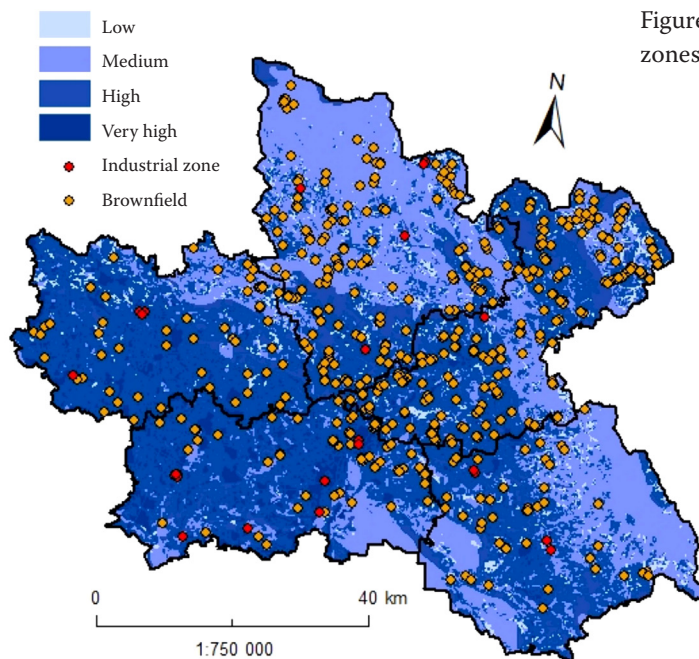


Figure 5. Retention water capacity and location of industrial zones and brownfields in the Hradec Králové region

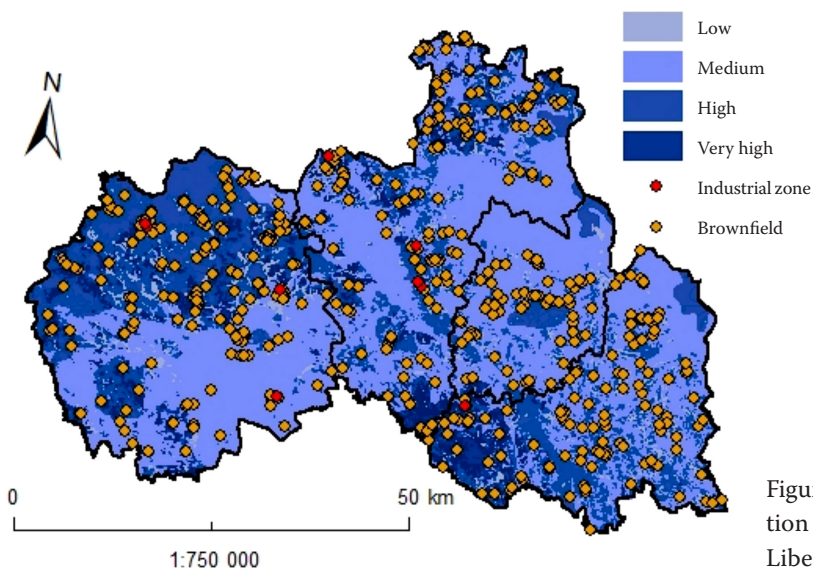


Figure 6. The water retention capacity and location of industrial zones and brownfields in the Liberec region

(WHC) (Klika at al. 1954; Valla at al. 2000; Zbírál at al. 2010).

Figure 7 provides a detailed view of the Liberec-North industrial zone. The zone is located in an area characterised by a high to very-high water-retention ability. The evaluation of the water retention capacity is shown in Table 5.

Another significant problem of industrial zones is their low utilisation. One would assume that these zones are 100% utilised and genuinely serve the proclaimed purpose, especially when the State finances investment incentives, and has an eminent interest in building industrial zones. However, the reality

is different. The usability of industrial zones in the Hradec Králové Region is listed in Table 6.

Very few brownfield areas are used for building industrial zones, as can be seen in Figures 8 and 9. Figure 8 also shows the soil groups in the area.

Table 5. Evaluation of the water retention capacity

Water retention capacity (mm)	Legend
< 100	low
100–200	medium
200–300	high
> 300	very high

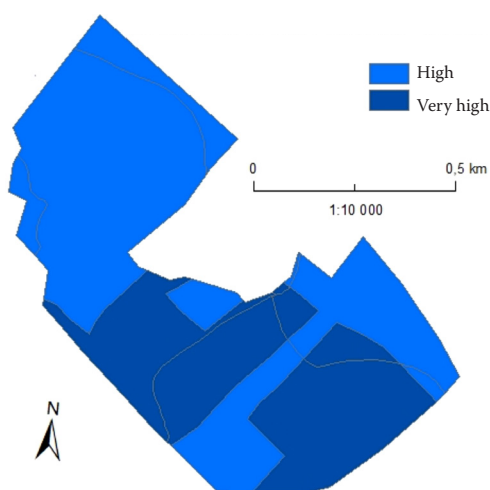


Figure 7. The water retention capacity in the industrial zone Liberec – North

In Central Bohemia, a total of sixteen industrial zones are currently registered. A quarter of these are of areas greater than 100 ha, so they can be classified as zones of greater importance, the others are zones of smaller areas. The occupancy rate of the industrial zones in the Central Bohemia Region is higher in relation to the whole of the Czech Republic. It is influenced by the proximity of the capital city of Prague, the traffic infrastructure, the high density of the settlements or facilities with a technical infrastructure. Nevertheless, the offer of the areas

clearly exceeds the demand. This situation has been deliberately planned in the past to ensure a competitive environment. The occupancy rate of industrial zones in Central Bohemia is shown in Table 7.

In the Central Bohemian Region, there are also very few brownfield sites which are used for building industrial zones. The location of industrial zones and brownfields are shown in Figures 10 and 11. Figure 10 also shows the soil groups in the area.

In the Liberec Region, eight industrial zones are defined. The industrial zones occupy about 451.7 ha of land, while the whole area of the Liberec Region is 316 300 ha.

Liberec is a town with approximately 104 000 inhabitants. The occupancy rate of the industrial zones in the Liberec Region is shown in Table 8.

The location of the industrial zones and brownfields in the Liberec Region are shown in Figures 12 and 13. Figure 12 also shows the soil groups in the area.

Use of brownfields. The use of brownfields is generally insufficient. The situation is illustrated in the case of the Liberec Region in Table 9. The table shows the overall size of the industrial zones and the area of brownfields extending into the industrial zones in the table.

Another example of the insufficient use of brownfields for industrial zones is the industrial zone of Kuřívody, Liberec Region. In Figure 14, a brownfield as large as this industrial zone is shown adjacent to the industrial zone of Kuřívody, but it is unused.

Table 6. The utilisation of industrial zones in the Hradec Králové region

Industrial zone	Land area (ha)			Used (%)
	overall	used	not used	
1 Červený Kostelec	48	48	0	100
2 Hradec Králové	15.3	0	15.3	0
3 Jičín ¹	70.9	50.9	approx. 20	approx. 72
4 Kopidlno	84	0	84	0
5 Lánov	30	30	0	100
6 Nový Bydžov	47	47	0	100
7 Opočno	24	24	0	100
8 Rychnov nad Kněžnou	49.6	49.6	0	100
9 Smiřice	54	54	0	100
10 Solnice	37	37	0	100
11 Trutnov	22.6	0	22.6	0
12 Žacléř	21.3	0	21.3	0
Total	503.7	340.5	163.2	67.6

¹approx 20% = unused III zone

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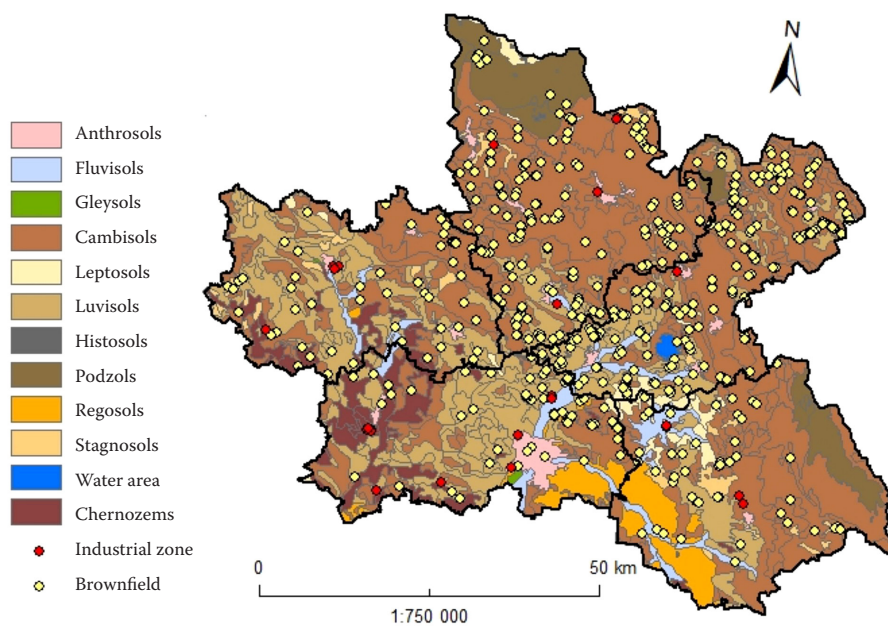


Figure 8. Soil groups and location of industrial zones and brownfields in the Hradec Králové region

Employment factors, number of staff of local and foreign origin (agency workers), qualified and unskilled labour force, crime. The majority of companies do not provide data about their employees, especially their agency workers, but it is foreigners who largely ensure the operation of these industrial companies. Industrial zones often provide job opportunities for

less qualified professions, these professions are not frequently found among Czech workers in the Czech labour market. These companies, therefore, employ people from less developed parts of the world, who are also willing to work for less money and under worse conditions. Places with a higher number of foreigners are more affected by increased crime rates (in the

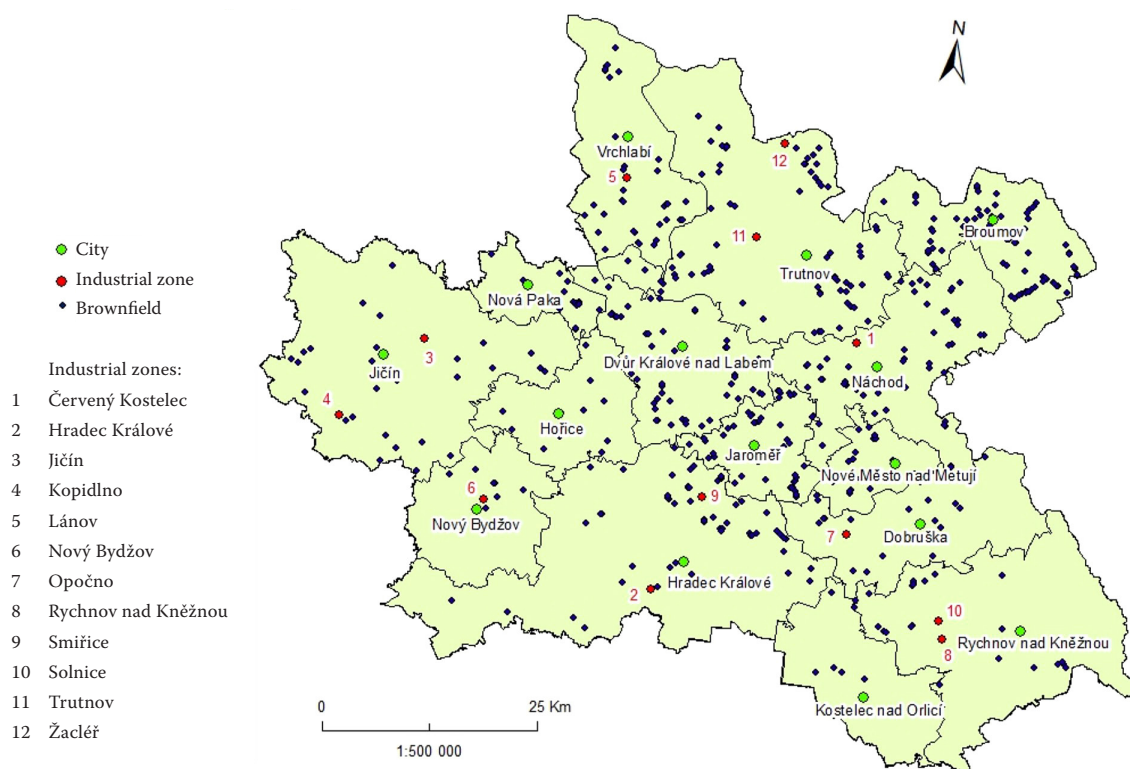


Figure 9. Number and location of industrial zones and brownfields in the Hradec Králové region

Table 7. The occupancy rate of industrial zones in the Central Bohemian region

Industrial zone		Land area (ha)			Used (%)
		overall	used	not used	
1	Kolín ¹	370	283	87	76
2	Kutná Hora – 2	95	80	15	84
3	Čáslav	69	46.27	22.73	67
4	Benátky nad Jizerou	30	27	3	90
5	Milovice	30	0	30	0
6	Nové Strašecí	60	0	60	0
7	Skalka	50	0	50	0
8	Příbram	36	31	5	86
9	Poříčí nad Sázavou	36.3	25	11.3	70
10	Nymburk – South	28	11	17	3
11	Nymburk – North	234	19	215	8
12	Mladá Boleslav – East	200	150	50	25
13	Kutná Hora – 1	24	0	24	0
14	Hlízov ²	20	0	20	0
15	Kozomín	153	41	112	27
16	Mladá Boleslav – Kosmonosy ³	46	46	0	100
Total		1 481.3	759.27	722.03	51.3

¹further extension on arable land is in the plan; ²in the plan; ³further extension on arable land (27 ha) is in the plan

Rychnov Region – an increase in crime by 400%). In addition, the foreign companies, who often use these industrial zones, are often based outside the Czech Republic, and sometimes outside the EU.

What can be the future of these industrial sites in view of increased automation, and the need for more highly skilled workers?

The number of employees in the industrial zones in the Hradec Králové Region are shown in Table 10.

Data on the number of workers are incomplete due to the difficult availability of the relevant data. The Labour Offices are allegedly in possession of the data, but cannot communicate them due to Law No. 110/2019 Coll. of the Personal Data Processing, and

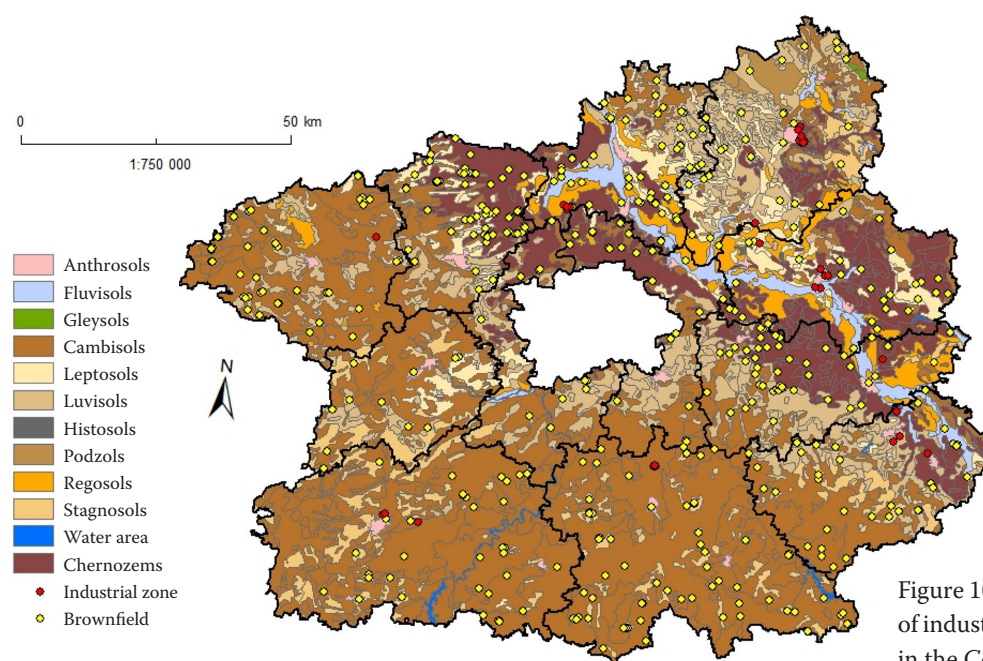


Figure 10. Soil groups and location of industrial zones and brownfields in the Central Bohemian region

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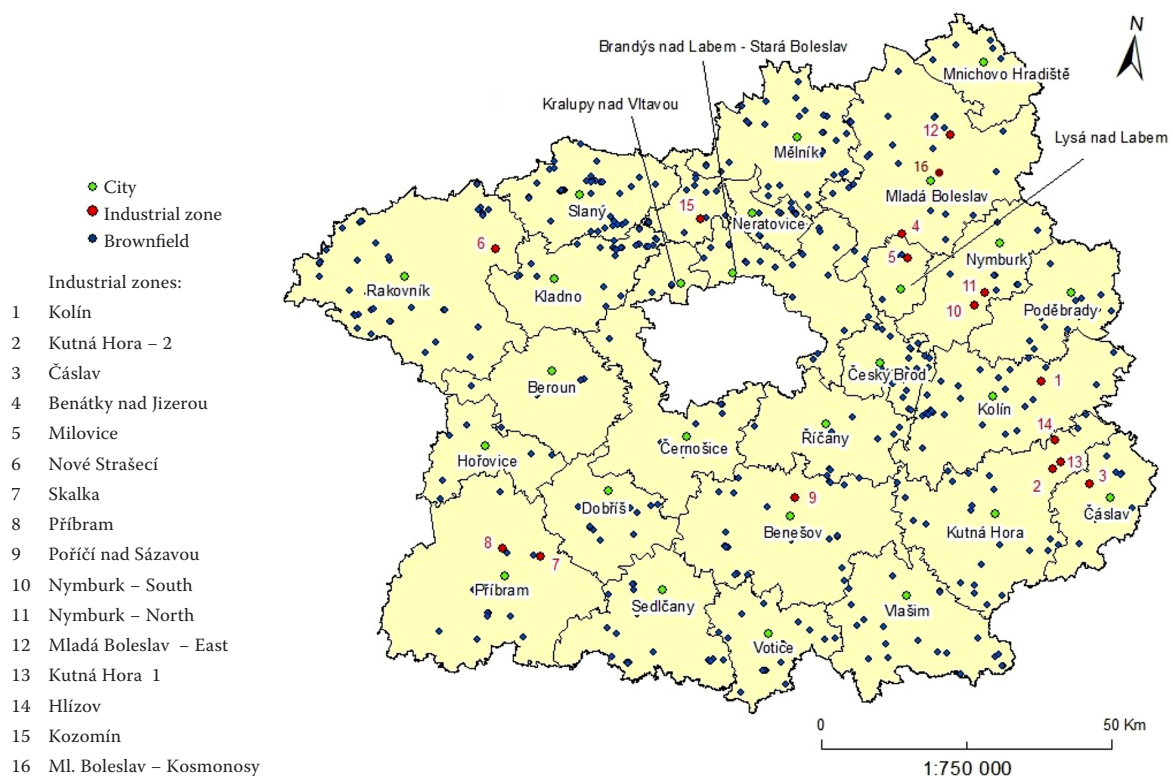


Figure 11. Number and location of industrial zones and brownfields in the Central Bohemian region

the Regulation EU 2016/679 (General Data Protection Regulation).

Most jobs were created in Jičín, seven industrial zones created no jobs.

DISCUSSION

The number of employees in agriculture. Employment in agriculture declined from 10.3% to 3.7% in

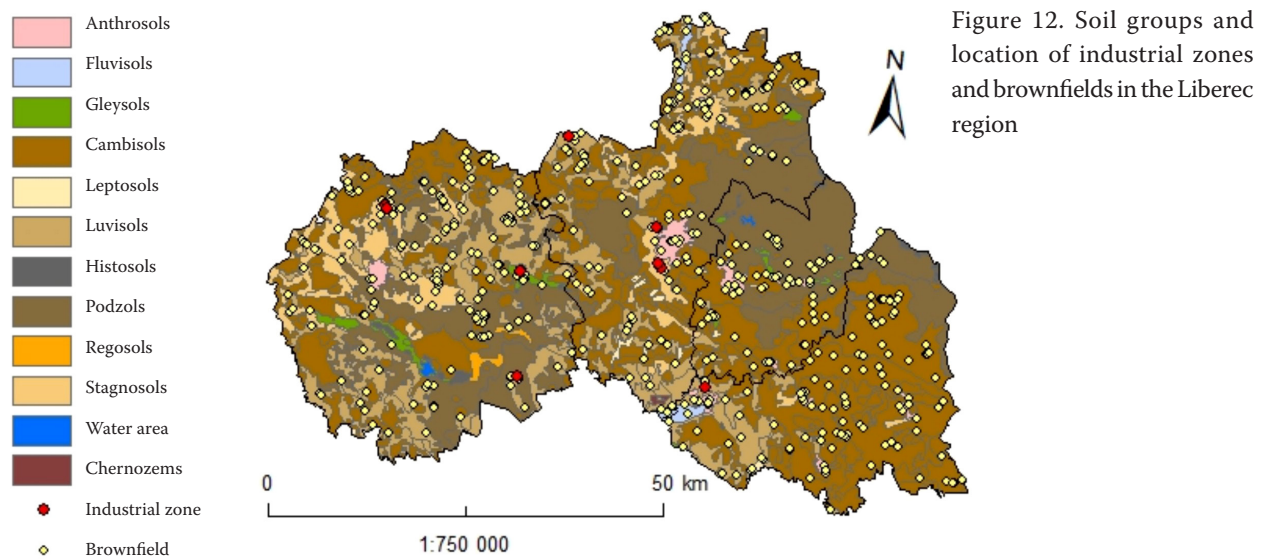
total employment in the civil sector between 1989 and 2001, to 2.2% in 2013 and, in 2017, it was only 0.95%.

Agriculture hardly creates any new jobs. If there is a demand from businesses, it predominantly concerns skilled workers in the livestock sector, which are lacking in the agrarian labour market. The reason for the lack of interest of young and skilled workers in farming results from the low labour price in the sector, the unsatisfactory working hours, the specific

Table 8. The occupancy rate of industrial zones in the Liberec region

Industrial zone	Land area (ha)			Used (%)
	overall	used	not used	
1 Ralsko – Kuřivody	75	25.8	49.2	34.4
2 Turnov ¹	41	24.6	16.4	60
3 Stráž pod Ralskem ²	56.7	0	56.7	0
4 Liberec – North	67	57	10	85.1
5 Liberec – South	125	125	0	100
6 Hrádek nad Nisou ³	40	approx. 15	25	approx. 37.5
7 Nový Bor – 1 ³	21	0	21	0
8 Nový Bor – 2 ³	26	0	26	0
Total	451.7	247.4	204.3	54.8

¹Service zone – light industrial production; ²unspecified industrial production; ³light industrial production

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work environment, the physically demanding work, the low social prestige of agricultural employment, and the unclear business perspectives in the sector.

The supply of free labour is predominantly created by unskilled agricultural workers (including foreigners), who are most often employed (especially in districts with a high proportion of farm workers) as seasonal workers (Anonymous 2016).

The maturity of agriculture is often presented in the data on the reduction of the number of ag-

ricultural workers. However, these “superfluous” people have to seek employment elsewhere, often in industrial zones. The question, therefore, arises as to what structure of society and the labour market would be more beneficial and more enjoyable for both society and the individuals. If we were to use traditional farming through family farms, with affiliated production or agro-tourism, we would not the plunder land and landscape. The soil would naturally offer jobs to people again, and would not

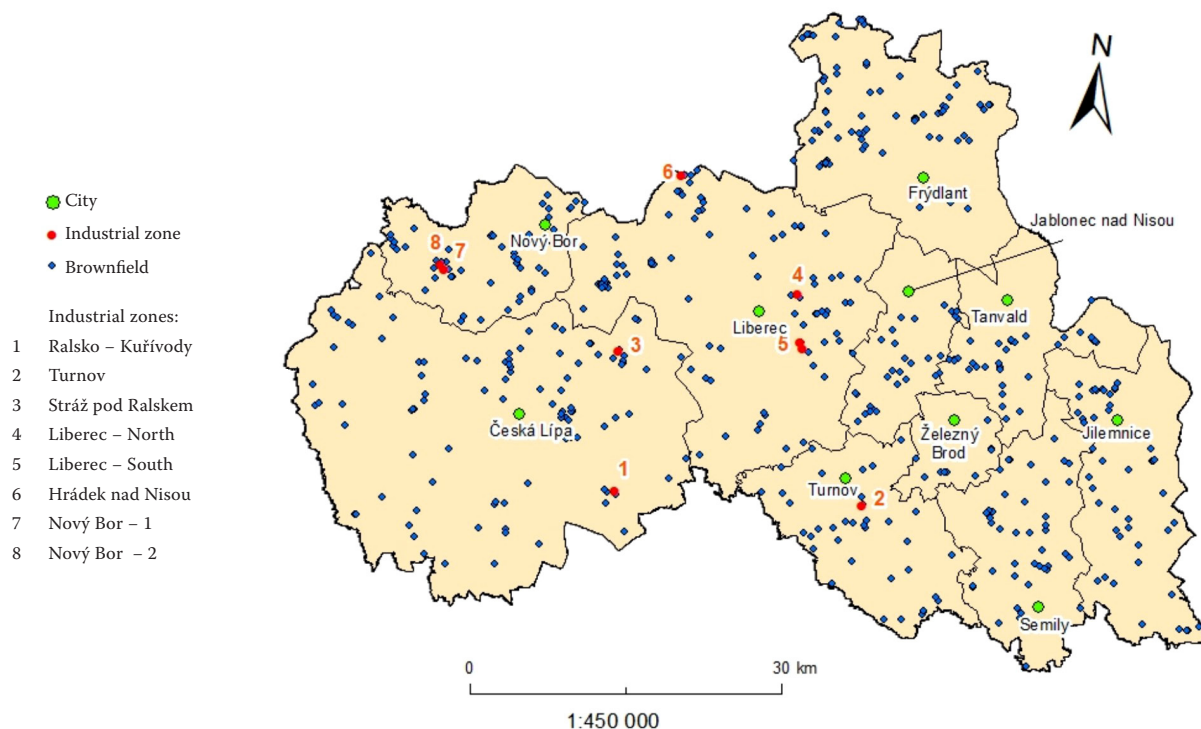


Figure 13. Number and location of industrial zones and brownfields in the Liberec region

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Table 9. Brownfields and their use as industrial zones in the Liberec region

Industrial zone		Acreage	Brownfield	Use of brownfields for area of industrial zones (%)
		(ha)		
1	Ralsko – Kuřivody	75	2.65	4
2	Turnov	41	2.53	6
3	Stráž pod Ralskem	56.7	27.69	49
4	Liberec – North	67	1.59	2
5	Liberec -South	125	2.24	2
6	Hrádek nad Nisou	40	4.09	10
7	Nový Bor – 1	21	5.71	27
8	Nový Bor – 2	26	0	0
Total		451.7	46.5	10.3

continue the rural depopulation, we would not occupy more land for factories often with a lower workforce level (e.g., components assembly) and to face all the negative phenomena associated with it, the influx of agency workers from abroad, increase in the crime rate, etc.

It is not a utopia, it is just a change in the view of agriculture, the structure of making the labour market and society, the distribution of subsidies for the benefit of economic entities which really farm.

Land ownership and behaviour of owners. Soil is specific good. In our conditions, is it a marketable property as well a natural resource. People have invested in buying land and are often uninterested in farming. Their approach is often, more or less,

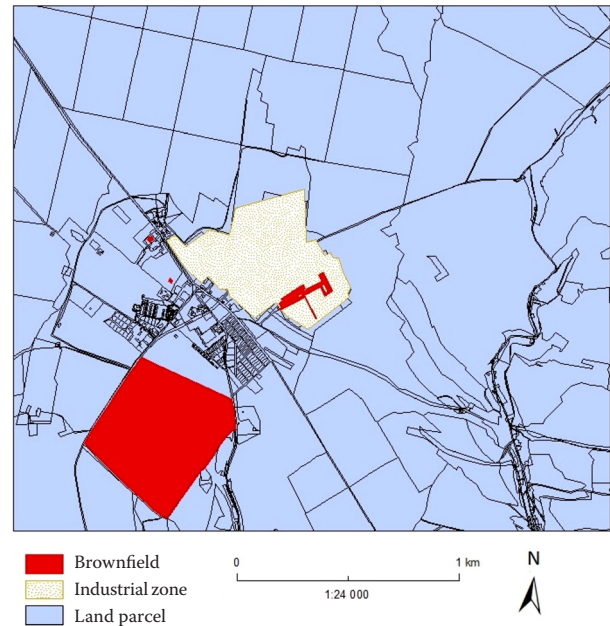


Figure 14. The industrial zone Kuřivody and narrow brownfields

predatory. Land ownership can be viewed only speculatively, as an excellent opportunity to deposit capital.

Sorice et al. (2011) and Martin et al. (2013) classified motivations for owning rural land. The resulting changes in land management have significant implications for the type and distribution of landscape-level disturbances that affect the delivery of ecosystem services. They classified landowners into three groups: agricultural production, multiple-objective, and lifestyle-oriented. They found that the cultural landscape of rural lands has transitioned from

Table 10. The numbers of employees in industrial zones in the Hradec Králové region

Industrial zone	Foreigners	Permanent employees	Note
Červený Kostelec	20	1135	
2 Hradec Králové	0	0	not yet used
3 Jičín	150	2630	III. zone unused
4 Kopidlno	0	0	not yet used
5 Lánov			not fully used
6 Nový Bydžov	25	485	
7 Opočno			
8 Rychnov nad Kněžnou	?	320	
9 Smiřice			
10 Solnice	0	35	
11 Trutnov			
12 Žacléř	0	0	not yet used
Total	?195	?4 605	

production-oriented to lifestyle-oriented landowners. This will lead to the changing resource dependency of rural landowners.

Land ownership and protection of natural resources. Martin et al. (2013) examined the relationship between the motivations for owning land and the implementation of conservation land management practices by landowners in the Southern Great Plains of the United States. They found that lifestyle-oriented landowners were overall less likely to adopt practices such as vegetation management, restoration, and water management. The ecological landscape and the associated flow of ecosystem services will likely change to the degree that the cultural landscape of rural lands transitions from production-oriented to lifestyle-oriented landowners. This poses new challenges to natural resource managers regarding education and policy.

Agriculture - the strategic sector. Unfortunately, even in the media, one may sometimes hear the opinion that food production is expensive in our country, it does not pay off, and it would have been cheaper if the food had been imported. These very unprofessional statements can be dangerous due to the fact that the land can be increasingly seen as a good money-deposit tool, which, in time, will be evaluated by the transfer of agricultural land to building plots.

Moreover, when Europe is facing a global climate change and migration, it is very important to ensure self-sufficiency in food production. This self-sufficiency is constantly constrained by the further reduction in the land taken for buildings.

Hydrological conditions. Every consumption of agricultural land causes the deterioration of the hydrological conditions in the country. There are extreme hydrological phenomena coming: droughts and or floods.

Floods are not solely based on hydro-meteorological conditions, but can also result from human activities, such as unplanned land use or haphazard development (Matthai 1990; Mileti & Gailus 2005; Brody et al. 2011a, b; Lee & Brody 2018).

The finding indicates that flood losses can be reduced with the intervention from local governments, planners, and policy makers by using proper land use management techniques (Lee & Brody 2018).

Society has lost irreplaceable agricultural land, and, at the same time, pays for the damages (both the individual and the state) caused by the torrential rain, floods or droughts. The high fees do not even offset these long-term damages.

Roads overload. It is also necessary to mention the overload of the roads, their frequent and considerable destruction, caused mainly by truck traffic. The overload itself raises again the need to expand the motorway and road network and, thus, again to consume the arable land.

On the other hand, a transport infrastructure is important, and it is necessary to find acceptable compromises between highway builders and conservationists. Any boom of new economic activities requires new transport networks. The effects of the transport infrastructure on the land use is mentioned in other studies. More intensive use of railways, especially for freight transportation could be a solution.

The price has a large influence on the land management and its use. In one economic study (Ustaoglu et al. 2016), the economic evaluation of agricultural land is based on the Net Present Value (NPV) method, a method that aims at uncovering the operational production values of the land rather than real estate market value. The scientific relevance of this work is the development of a comprehensive methodology for the economic evaluation of agricultural land uses in different EU countries, including the provision of an EU-wide database of the NPVs of agricultural land use.

CONCLUSION

After answering these questions, it is clear that soil protection is not only in the interest of a narrow group of theoretical specialists or farmers but, society in general.

Soil is the alpha and omega of our life and should be perceived as so by the whole society. Additionally, all of society should benefit from our common country, that is the land, and not only a limited group of investors who have, so far, managed to convert the agricultural land to buildings in order to achieve a quick and easy profit.

The theme deserves a deeper analysis from other specialists (economists, sociologists, etc.).

The problem of the rapid loss of fertile land is not only important in the Czech Republic, but also in the EU. At times of climate changes and political uncertainty (also due to climate change), it is necessary to maintain food self-sufficiency in Europe.

A possible solution is offered by the legislation, where it would be appropriate to take the subsequent soil-sealing through the exclusion of land from the

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agricultural land into account and to differentiate the fees according to the soil-sealing. If the result is an industrial zone with a predominance of impermeable areas, the set-aside fees should be significantly higher. If there is a surface using permeable technologies such as permeable concrete, asphalt, paving, the fees would be left at the current level. If the land continues to retain its retention function, e.g., in the case of protective afforestation, the current charges could be reduced. Such fees would be more objective and would motivate the companies using the industrial zones to help with the soil protection better soil protection. Furthermore, to professionally evaluate all the soil functions, to publish the results not only in professional journals, but in a popular format, especially in publicly available media, as opposed to commonly circulated opinions that the construction of industrial zones is the only way leading to economic growth. The results can also be offered to policy makers as a basis for further and sustainable land use decisions.

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