



STUDIA OBSZARÓW WIEJSKICH  
2020, volume 56, pp. 73-102  
<https://doi.org/10.7163/SOW.56.3>



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## Romanian post-communist agriculture – structural dynamics and challenges

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**Abstract:** This paper represents an overview on the structural dynamics of Romanian agriculture, and the challenges faced. Describing the main changes over the last three decades, the analysis here should facilitate understanding of how communist-era agriculture of a centralised state might be transformed into something able to operate efficiently under free-market conditions. The specifics of Romania’s agricultural transition connect closely with certain preconditions, among them in particular the high proportion of the national population that is still rural. A privatisation process set in rapidly post-1989, as the old State Farms were dissolved over just two years. The role this economic branch played in the generation of GDP decreased, in a manner suggesting the former level will not be re-achieved, but farmers have worked to improve their basic infrastructure. The main obstacle would now seem to be the excessive fragmentation of agricultural land and the only-slow process of consolidation. Current characteristics of structural dynamics are visible in trends towards specialisation in farming, livestock restructuring, the slow (re-) development of irrigation infrastructure, increased land prices and more typical processes of a “land grab” profile. In this connection, the paper identifies 9 challenges Romanian agriculture faces, presenting these synthetically to ensure a clarification of objectives, with a view to greater upgrading of the country’s huge potential being achieved.

**Keywords:** post-socialist agricultural changes, excessive land fragmentation, land grabbing, Romania.

### Introduction

Romania has been known, both in its more-distant history and most recently, as a country that supplies grain and oil. This has gone some way to explaining its attractiveness to some of the world’s great powers. However, while oil has ceased to be one of the country’s economic strengths, agriculture has continued to be an important branch of the national economy (Otiman et al. 2013). Indeed, the weight that may be attached to agricultural activities even now can be appreciated by reference to the structure of Romania’s active population and percentage of the rural population, as well as the balance of foreign trade.

Those seeking to understanding transformations ongoing in Romanian agriculture over the last century will need to make numerous connections with a variety of different events – not least of course the First and Second World Wars, but also in particular various other political changes of a fundamental nature (Surd 1994). These latter were generated by two relatively sudden shifts from a privately-owned system in agriculture through

to a state and cooperative system, and then back again. The two transitions of this kind, each condensed into a relatively short period of time, represented real shocks for agriculture, as for the Romanian economy and society.

By comparison with other post-communist countries now Member States of the European Union, Romania passed through agricultural change of very high intensity, due to small proportion of individual owners remaining during the communist period. Such a situation contrasted with those in Poland and Hungary, where changes in the ownership of agricultural land were on a smaller scale, as well as in Czechia (Bański 2011; Jančák et al. 2019).

When the two transition periods in Romanian history are compared, it can be seen that, while overall shaping was achieved over an approximately equal time interval, the transition from communist-era agriculture to farming based around private property was far steeper in character. However, both denoted, not only direct impacts on agricultural production, but also psychological trauma (Ianoş 1994). In the first case, the lack of inherited land meant an existential shock for the Romanian peasant, with a long period of adaptation therefore required. In the second case, the 1989 collapse of the totalitarian regime meant a change to a phase of transition from planned economy to market economy (Amblard et al. 2002). In such a context, the then application of land legislation has been associated with many appeals, but especially with the psychological paradox of land coming into the possession of people lacking the financial resources – and even the technical means – to make use of it.

The first decade of the transition was also the most difficult, as people strived to compensate for the above shortcomings through sheer physical effort – as well as the use of traditional means, e.g. by using animals to do agricultural work. This complex process ensuing once the old communist-era forms had been deconstructed, has been defined in the literature as reverse modernisation (Endresen 1994).

The policy of the reprivatisation of agriculture was a phased one that sought to mitigate and limit possible conflicts generated by the neglect of changes affecting society through the decades-long communist era (Ianoş 1995; Rusu et al. 2011). The most difficult moment arose in the 1990 and 1991, when the Romanian village proved to be no longer the same as that from 1945. Definitive migrations from areas of demographic surplus to deficient areas demanded that account be taken of new social structures at village level, with solutions by which to avoid local crises then sought. The first step towards the reprivatisation process was started by Decree Law no. 42/1990, the application of which was followed on immediately (at the end of February 1990), and was able to ensure some attenuation of a process that would have seen the old structures destroyed instantly.

Following the adoption and implementation of the Land Fund Law (no. 18/1991), agriculture became attractive because of the food crisis, very strong inflation, and – especially – the rapid destructuring of industry. For a decade, agriculture became the main tool by which to mitigate social effects of the exodus of labor accompanying deindustrialisation, in the face of the inability of services to attract the surplus workforce on to the labour market. The law in question also set out ways in which new farmers might associate, provisions on the renting of land (given that new owners were in many cases elderly, or else city-dwelling heirs of former owners), and the ways in which commercial agricultural societies were to be established.

Subsequently, the amendment and completion of the Land Fund Law allowed for an increase in areas of land that could be allocated to former owners through the abo-

lition of State Farms, as well as land sale-purchase processes. A foundation for a shift towards increasingly efficient agriculture was therefore laid. Unfortunately, the entire transition process was accompanied by the destruction of irrigation infrastructure, structure where the livestock population was concerned, and facilities engaging in agricultural research. In regard to the concrete example of the irrigation system, some 75% of that was destroyed, while the remainder is by no means entirely functional (Barbu 2019). For such reasons, the process of the “relaunch” of Romanian agriculture (still dependent on climatic conditions) was delayed.

Romania’s integration into the European Union has created premises for accelerating processes by which agricultural activities become more streamlined, thanks to the possibility of European development funds in the field being accessed, with specific programmes and projects defined by the EU’s CAP also implemented.

Still far from reaching the level of agricultural performance registered in EU Member States more generally (including even certain ex-communist states), Romanian agriculture is making progress. This reflects benefit drawn from various natural resources, policies and organisational systems aimed at increasing productivity. New guidelines in turn focus on premises being put in place to ensure continuity of production in agriculture through increasing independence of climatic conditions, an effort to capitalise on the strengths of new technologies, and an openness to bio-agriculture.

At the same time there are certain trends that demonstrate a specialisation of Romanian agriculture in the dominant direction of cereal-growing, albeit with an increase in numbers of sheep on farms also noted (Galluzzo 2016).

### **From a state and collective structure to a private one**

The process of founding Cooperatives itself began timidly in 1949, at a relatively slow pace, due to resistance on the part of the population. This continued through to 1957-1958, after which the process accelerated, ending in April 1962. Despite several attempts to expand further into mountainous or hilly areas of Romania, the zone of the country accommodating Co-operatives in fact remained within the same limits throughout the communist era.

The period between 1949 and 1962 marked the transition from the dominance of private property in agriculture to Cooperative and State-Farm dominance. An extremely complex process was actually involved here, extending to arrests, blackmail and intimidation, but also with a remarkable ongoing resistance of inhabitants in certain parts of the country. As a result, Romanian agriculture as of late 1989 had three forms of ownership: the dominant state in large areas of agricultural production; the Cooperative form quasi-present on the plains and in the hills; and the individual form lingering on in areas unfavourable for plant cultivation or intensive animal husbandry.

Setting the above against the general configuration of Romania’s relief, a depiction of the distribution of these 3 main groups of landowners shows how State Farms and Cooperatives prevailed at the periphery, while individual producers were present in the mountainous central areas.

The structure of agricultural land in the last year of communism in Romania was as follows: former agricultural Cooperatives (entities of the *Kolkhoz* type) owned 60.4%, State

Farms (of the *Sovkhoz* type) owned 13.8%, individual producers owned 20.4%, and there then followed remaining state-type owners. However, this apparent importance of the sector comprising individual owners in reality related to pastureland and meadows in rugged areas. The share of actual arable land was very low, and what there was of only limited productivity.

A decline in the effective participation in farming of Members from the Cooperatives became noticeable post-1975, when extensive industrialisation was further accentuated, including in the countryside. Over just 5 years, numbers of Cooperatives declined by 53% – thereby ensuring that their participation was at the level of just 24% by 1989 (Ianoş 1995).

After December 1989, the ensuing process of decollectivisation and privatisation in agriculture had several stages, but tended to take place (sometimes locally or regionally) at a rate faster than the legal framework was able to develop. However, the changes in the legislative plan and adaptation of certain policies in the field to the realities of Romanian rural areas managed to ensure an extremely difficult transition. On the one hand there was a quite-explicable desire (in the generation of 65-70 year-olds especially), to quickly re-own former locations (in the conditions in which they could not be reconstituted, especially in the old Kingdom!), while on the other there was the totally new situation characterising the Romanian village. Having made great sacrifices, directly or indirectly, with Cooperatives and extensive industrialisation forced upon it, demographic emptying and the payment of external debts, the village had to rediscover balance through the restoration of the natural relationship involving ownership of agricultural land.

The first measures taken by the Provisional Government involved the cancellation of the debts of agricultural units – which amounted to about 100 billion lei (some \$10 bn), as well as the liberalisation of prices on peasant markets through the removal of maximum limits. The second important moment was the entry into force in February 1990 of Decree-Law no. 42, which in essence provided for the allocation for personal use to each family working on an agricultural Cooperative an area of 0.5 ha, and 0.25 per family to other inhabitants. It should be mentioned that, over a period of 45 years, the effect of migrations (including rural) ensured that non-native populations of villages are at the level of 10-20% in certain localities, especially Banat. The effects of the implementation of this Decree were multiple: a ca. 25% decrease (nationally) in area accounted for by agricultural Cooperatives and even the abolition of certain of them located in hilly areas (as when 11 were abolished in Arad county), and especially the reappearance of a feeling of ownership among the villagers.

This was the beginning of the quasi-total destructuring of communist-era Cooperatives, with an accentuation of the feeling that any legal form of association was now being rejected, even if in 1990 there was much more active (5-20%) participation of peasants in their agricultural activities. For the first time in several decades, the first year of post-communism saw satisfactory incomes in products achieved at the level of individual households – a circumstance that left villagers emboldened to press on with their land-privatisation efforts.

As a result, 20<sup>th</sup> February 1991 brought adoption of the aforementioned Land Law, complete with its 9 chapters detaching the establishment of property rights, as well as provisions on land belonging to the state and the legal circulation of the land (Rey et al. 1992). For a period of 8 years all rural inhabitants were exempt from paying taxes, with

those receiving land for the first time not permitted to sell it until 10 years had elapsed. The maximum permitted area for property arising out of a purchase was given as 100 ha.

The implementation of this law also generated many problems related to the reconstruction of old properties (on the basis of different documents and witnesses), the impossibility of granting property titles, and the fact that 451 local-authority areas (“*comunes*”) could not provide a minimum area of 0.5 ha per family, while another 1035 reduced the areas belonging to former owners in order to ensure such a minimum. Other problems related to state ownership of land that remained intact, but which – under pressure from the local population – was diminished in communes lacking possibilities for a minimum of 0.5 ha to be offered.

Obviously, there were many social tensions surrounding the above issues, including: a) appeals relating to the allocation of land belonging to given families (220,000 nationwide); b) abusive occupation of areas formerly included within the State Farms (11,400 cases); c) the distribution according in line with arbitrary criteria of goods belonging to the abolished Cooperatives (zootechnical farms, horticultural items, buildings, irrigation installations, etc.). A major problem, evolving subsequently, was the fact that only 45% of new landowners made a living out of work in agriculture, while 16% were commuters working in nearby cities, and the remaining 39% were resident in urban areas (Ianoş 1995).

For a very short period of time, the agricultural Cooperatives coexisted with certain forms of association. At national level, there are a very few situations in which certain former cooperatives have been preserved, developed later, and are functioning today as large agro-industrial complexes. A conclusive example is the Curtici agro-industrial complex, with the entire chain of production and sales of products obtained in cities and rural areas in the west of the country (Reinert et al. 2016).

Simultaneously with the legislation on the process of the restitution and distribution of land, laws adopted addressed the establishment and functioning of commercial companies (Law 31/1990), and family associations as legal entities (Law 36/1991). The Land Fund Law was subject to steady amendment such that, by 2000, a start could be made to the process of liquidation and transformation of the old State Farms. For about a decade the latter endured the deficit introduced on the agri-food market by private subsistence agriculture, which is totally inefficient thanks to excessive fragmentation. For example, the satisfaction of 6 million claims relating to impropriety led to the fragmentation of over 9.4 million ha of agricultural land into about 20 million separate lots (Amblard et al. 2002), while (obviously) making it impossible for the demand on the urban market to be covered. This explains why it was only in 2004 that the State Farms finally disappeared from the structure relating to the Romanian agricultural entities provided for in its domestic law.

Under the reform processes and agreements for pre-accession to the European Union, the years from 2001 saw the *SAPARD* Programme develop to stimulate agricultural and rural development. This later gave way to other programmes aimed at supporting Romanian farmers (Vasile et al. 2011). Post-2007, as Romania’s integration into the EU was taking place, the support for agriculture based around European and domestic funding was much more systematic, but the lack of experience in attracting such financial resources left its mark in the relatively small volume of financing attracted by projects in the first part of the financial period lasting between 2007 and 2013. At the same time, once their country had acceded, Romania’s farmers were encouraged to establish various forms of association with a view to their accessing Community funds more readily

(Chelaru et al. 2011). Within the next (2014-2020) funding period, the agriculture sector managed to attract higher funding, and to benefit more from funds than in the previous financial exercise which involved the Common Agricultural Policy.

### **An assessment of the structural dynamics of Romanian agriculture**

Agriculture is one of the most important economic sectors for a nation, both through its connections to other economic branches and its main objective, which is to ensure food security of the population as far as possible (Andrei 2017). Agricultural potential in Romania can be evaluated by reference to both the approx. 14.6 million ha of agricultural land that are present, and the large (64.3%) share of that land that is arable. The latter area amounts to some 9.4 million ha in absolute terms. At the level of the EU, the 0.45 ha available per inhabitant on average leaves Romania in fifth place – after Spain, France, Germany and Poland (Aceleanu et al. 2015). This means that, if the problems faced by Romanian agriculture can be solved, greater food security is the reward – and not only for Romanians, but also for the EU as a whole.

### **The role of agriculture in the national and regional economy, evaluated by its share and dynamics in relation to GDP**

The current state of Romanian agriculture can be evaluated by analysing current dynamics and trends for its structural changes, with account (needing to be) taken of a very difficult transition from a centrally-planned economy to a market economy. In this sense, it is worth noting the declining share of GDP that agriculture has taken over the last three decades, even if – after a dramatic decrease related to change of ownership – there followed an increase in the efficiency of agricultural activities, almost independent of climatic conditions.

The rapid destructuring of Romanian industry, as well as of the former agricultural Cooperatives (even if this partially happened in 1990), determined a sudden increase of the share of GDP taken by agriculture – from 13.9% in 1989 to 18.0% in 1990. The acceleration of the deindustrialisation process maintained values of 17-18% through to the beginning of the next millennium, when it amounted to almost 13% (Table 1). In the last three years of the period, it was very favourable climate conditions that explained the increasing role in generating GDP that agriculture was able to play.

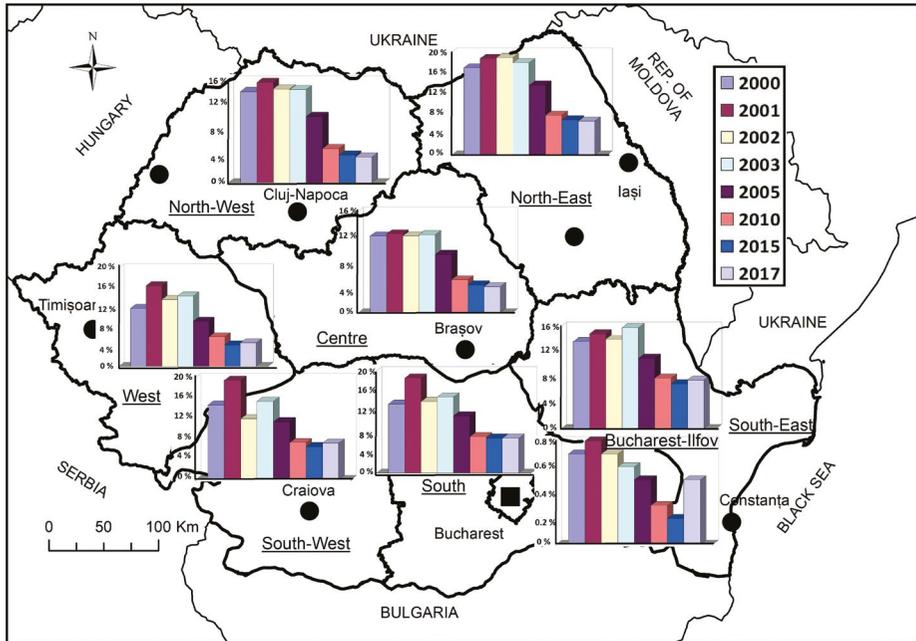
Given climatic and edaphic conditions that are rather differentiated from region to region, as well as different regional levels of development of the industrial and service sectors, it is easy to note different dynamics and levels for agriculture's share in regional GDP. As Fig. 1 shows, trends were more accentuated (i.e. showed a much more rapid decrease) in the country's central and western regions, as opposed to other parts. The Bucharest-Ilfov region is excluded from the analysis, given the extremely low share of regional GDP that farming takes there.

To explain this phenomenon, at least two arguments must be taken into account: the first is that the western regions of the country (positioned more favourably than Central or Western Europe) proved more attractive to investors, who benefited from the greater accessibility. In addition to this, they benefited from several elements of cooperation de-

**Table 1.** Trend for the share of national GDP taken by agriculture (1989-2018)

Year	1989	1990	1995	2000	2005	2010	2015	2018
Percentage taken by agriculture	13.9	18.0	18.3	10.9	8.5	5.0	4.2	4.4

Source: authors' own elaboration based on data from the National Institute for Statistics.



**Fig. 1.** Trends for agriculture's share of regional GDP

Source: authors' own elaboration based on data from the National Institute for Statistics.

veloped on an ethical-historical basis (with Austria and Germany), but also from an industry that had a different characteristic, in that it developed by capitalising on existing resources and infrastructure from the inter-War period and even from the beginning of the 20th century.

It was in association with new industrial activities that services were also able to develop more rapidly, ensuring a halving of the share of GDP taken by agriculture (despite the actual increase in volume of production). The process was particularly marked following integration in the EU. This trend is true for the North-Western, Western and Central regions, whose transformations proceeded much faster than elsewhere post-2007. A comparison of the South-Eastern Region with any of the aforementioned reveals a surprising reduction of the share of just 31% (as compared with, say, 61% in the case of the North-Western Region).

## Excessive fragmentation – a permanent obstacle to the development of Romanian agriculture

Thirty years on from the start of the “decooperativisation” process, Romania is home to the most far-reaching fragmentation of agricultural land to be noted anywhere in the EU, with more than a third of all agricultural holdings present (Unguru 2017). Assuming that the 3,422,026 agricultural holdings in existence in 2016 have at least three plots each on average, the real degree of fragmentation may extend to 15 million plots (even then down from the 20 million apparently present in 1992; Ianoş 1995). Surprisingly, the number of agricultural holdings in 2016 was approximately equal to that recorded in 1930, which was 3,280,000 (Istudor et al. 2018).

The 2002-2016 data for numbers of holdings by size category point to certain contradictory and somewhat unexpected trends, given the large number of landowners residing in cities and, especially a normal tendency for farms to merge. As can be observed, the number of small farms decreased rapidly after 2002 (maintaining an earlier trend), through to the time of EU integration, with levels below 44% reached around 2007 (Table 2).

The crisis from 2009-2012, but also the positive effects of economic growth in the years 2007-2009, help account for the greater number of small farms in 2010 and beyond that. This can be explained on the one hand by the fact that some inhabitants in rural area buy relatively small plots of land to help maintain their own existence; and on the other by the fact that previously land in the metropolitan and peri-urban areas of large cities was split into plots for purchase by city-dwellers, who went on to build houses near the urban localities. Obviously, the years 2002-2007 brought an increase in numbers of farms over 1 ha, following the purchase of smaller ones, with this in part explaining the near-3% increase in number for the 1-5 ha category.

After 2000, economic growth resumed and real reform of Romanian agriculture began – with the effect that a process of concentration became increasingly obvious (Popovici et al. 2018), even in terms of an increase for farms of over 20 ha (from 0.79% of the total in 2002 to 1.1% in 2016). The effects on mergers need analysing in correlation with land the given holdings were managing. As noted by Andrei (2020), farms over 50 ha (just 0.57% of the total) alone owned over 52% of the land used in agriculture in 2016.

**Table 2.** Size distribution for the agricultural holdings utilising agricultural areas

Farm size (ha)	Number					Percentage of total				
	2002	2007	2010	2013	2016	2002	2007	2010	2013	2016
< 1	2,169,257	1,685,500	2,019,446	1,943,382	1,770,569	50.46	43.76	54.22	54.53	52.96
1-5	1,850,286	1,765,660	1,439,677	1,337,799	1,290,358	43.04	45.84	38.66	37.54	38.61
5-10	218,880	299,996	182,444	193,871	194,200	5.09	7.79	4.90	5.44	5.81
10-20	37,408	70,128	43,609	49,648	50,212	0.87	1.82	0.35	1.39	1.50
20-50	9,477	16,107	17,943	18,727	18,523	0.22	0.42	0.48	0.53	0.53
50-100	3,850	4,791	7,556	7,263	6,013	0.09	0.12	0.20	0.20	0.20
>100	10,203	9,608	13,657	13,075	12,310	0.24	0.25	0.37	0.37	0.37
Total	4,299,361	3,851,790	3,724,332	3,563,765	3,342,185	100.00	100.00	100.00	100.00	100.00

Source: authors' own elaboration based on data from the National Institute for Statistics.

Why does Romania have the most-fragmented agricultural land? This is a question capable of sustaining the idea that the country's population lacks awareness of the need for modern agriculture to operate on the basis of merged land holdings! However, the reality is that Romania is the European country with the largest share of the population still living in rural areas. And for such people, owning land (even just 0.5 ha) means a certain solution being offered in the matter of subsistence. Let us not forget that agricultural holdings under 1 ha represent about 52% of the total, with this being a percentage slightly higher than for the population living in rural areas (which was about 46% according to the 2011 census). To that we need to add the population living in very many small towns that also have a partly-agricultural profile.

There is thus an explanation for which Romania is the CEEC registering the smallest number of small agricultural holdings to have disappeared in the first two decades of transition (a mere 14% of the total). In contrast, Bulgaria and Hungary have seen their numbers of small agricultural holdings reduced by 48 and 45% respectively (Kay et al. 2015).

In the same period, there has been an important difference between the total number of agricultural holdings and the number of these utilising agricultural areas (Table 3). This means that some lacked the resources to make use of their entire agricultural area – sufficient to account for the permanent decline in the amount of land used. This is the case for 79,211 individual holdings, as well as 451 agricultural holdings enjoying legal personality. The effect was measured in terms of the steady reduction in areas of agricultural land in use that is reflected in a marked increase in land abandonment (over 1.4 million ha, between 2002 and 2016). This abandonment process has been remarked upon specifically by other scholars using Landsat data for the Carpathian ecoregion. What has been emphasised in particular is a process of the abandonment of cropland proving a very clear trend during the transition (Griffith et al. 2013).

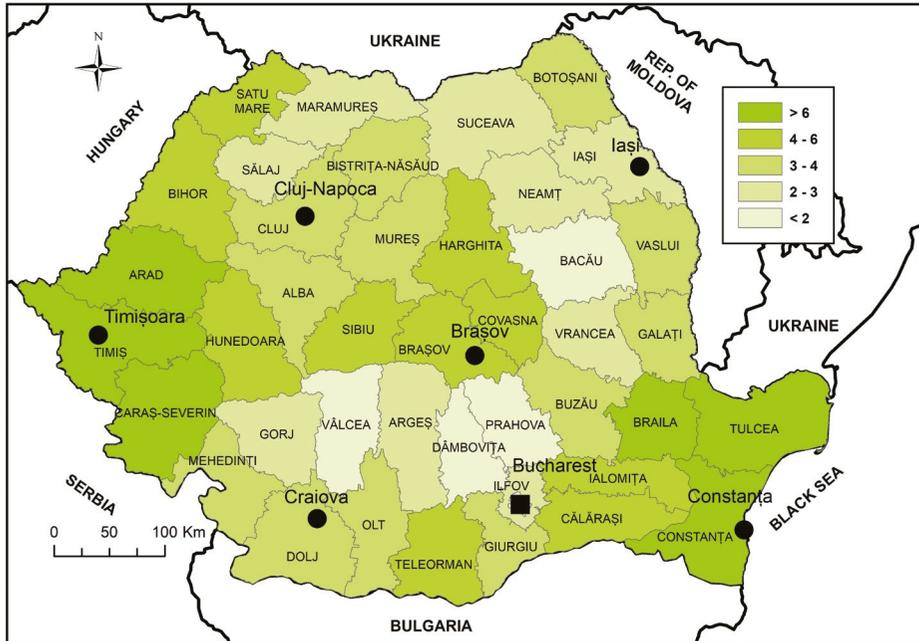
Fragmentation is seen to differ markedly from county to county – in correlation with the country's physico-geographical characteristics, as well as population density. The map in Fig. 1 shows the average size of agriculture holdings, and highlights certain interesting similarities between the periphery and the centre of Romania, even as the latter includes certain counties with a high share of land that is mountainous. This similarity is revealed in different categories of land use. While arable land predominates at the periphery, in the centre it is hayfields that account for a high share. This explains why counties like Constanța, Brăila, Timiș, Arad, etc., have the same values as Brașov, Covasna, Harghita, Sibiu and Hunedoara (Fig. 2).

The peri-central areas of the country are dominated by counties manifesting lowest values (under 3 ha), with this reflecting limited amounts of agriculture land and a high

**Table 3.** Changes relating to numbers of holdings utilising agricultural land, by type of ownership

Legal status	2002	2005	2007	2010	2013	2016
Agricultural holdings lacking legal personality	4,277,315	4,103,404	3,834,407	3,694,104	3,536,315	3,316,535
Agricultural holdings with legal personality	22,046	17,843	17,383	30,228	27,450	25,650
Total	4,299,361	4,121,247	3,851,790	3,724,332	3,563,765	3,342,185

Source: authors' own elaboration based on data from the National Institute for Statistics.



**Fig. 2.** The average size of agriculture holdings (ha, 2016)

Source: authors' own elaboration based on data from the National Institute for Statistics.

density of villages and, implicitly, of population (about a continuous belt between Gorj and Maramureş and Sălaj, via Vrancea county). Two exceptions are represented by Ilfov county (surrounding Bucharest, where the land is very fragmented into small plots whose likely fate is to have separate dwellings constructed on them), as well as Iaşi (one of the most heavily-populated counties in Romania).

### Signs of agricultural specialisation?

Under the totalitarian regime, industry had to produce all the tools and means for the national economy, and the vision regarding the development of agriculture was dominated by action to increase the area in cultivation. In this respect, the policy in the field took two directions: one to extend agriculture areas in the Danube Delta by about 100,000 ha, and the second to restore land. Both visions flew in the face of the country's sustainable development, explaining why first concrete measures taken by the new authorities in December 1989 entailed abolition of the so-called rural systematisation programme, as well as a "re-ecologisation" of built or planned enclosures from the Danube Delta to be transformed into agricultural areas.

These measures, as well as those aimed at greening other areas, led to a reduction in the area cultivated in 1990 by about 450,000 ha (from 9,846,000 ha in 1989 to 9,402,000 a year later). In reality, the area cultivated in 1990 was the maximum that could be managed in this way given that land's productive potential.

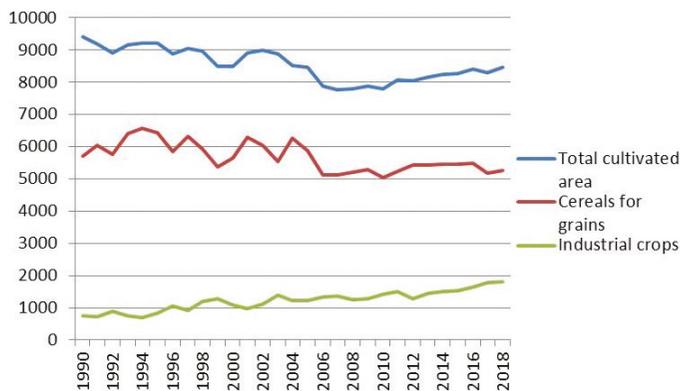
As Fig. 3 shows, the transition stage was characterised by differences in the area under cultivation in the range 9.4 million ha (in 1990) to 7.7 million ha (in 2007). Paradoxically, there were slight increases subsequently, though not above a level of 8.5 million ha.

Where the current structure of cultivated land is concerned, it is the categories of cereals and industrial crops that stand out. However, while the area used in growing cereals is displaying a slight downward trend, the trend for industrial plants is one of consistent increase. Thus, where the difference in the areas occupied as of 1990 was of some 5 million ha, by 2018 that difference had shrunk to just 3.4 million ha. This means that levels of production possible for cereal crops are sufficient even when a more limited area is in cultivation now, while also revealing increasing demand for industrial plants on the domestic and international markets.

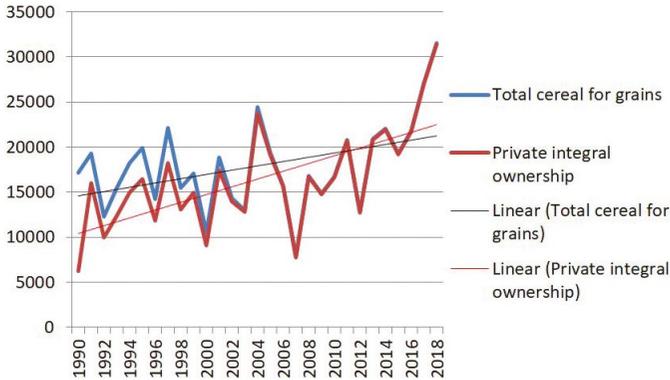
A reduction in the area cultivated can also be attributed to a slight decrease in the area of arable land – by about 55,000 ha between 1990 and 2014. In fact, within the overall structure determined for land use, arable land has a very large share that was used in construction. Between 1990 and 2014, the area owned by construction companies increased by over 135,000 ha (a good part of this comprising land earlier designated as pastures and meadows, especially in mountainous areas).

The form of ownership became almost complete from 2003 and 2004, when the last State Farms were closed down. Fig. 4 shows how private ownership in cereal production was insignificant compared with state ownerships, as the two distributions coming closest to the total. At the same time, it was possible to note an upward trend for cereal production, even if the area showed a slight decrease (as in Fig. 3), followed by a period of near-constancy.

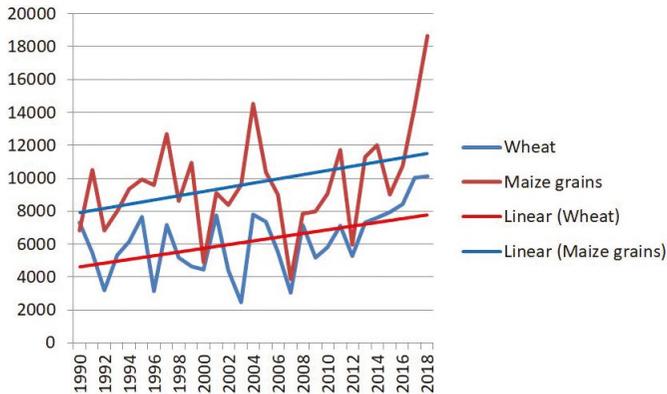
The production of cereals is largely approximated by wheat plus maize. Fig. 5 shows how, notwithstanding year-on-year climate-related fluctuations, the production of both cereals is increasing. In recent years this increase has been even more spectacular, explaining how Romania is among the largest European producers (placed 5<sup>th</sup> or 6<sup>th</sup> where wheat is concerned, and 3<sup>rd</sup> or 4<sup>th</sup> in the case of maize). These positions are found in some written material which, in the inter-War period saw Romania called “the Granary of Europe”.



**Fig. 3.** Trend for overall areas assigned to the growing of cereals and industrial crops ('000 ha)  
Source: authors' own elaboration based on data from the National Institute for Statistics.



**Fig. 4.** 1990-2018 dynamics for crop production (in '000 t), by type of ownership  
Source: authors' own elaboration based on data from the National Institute for Statistics.



**Fig. 5.** 1990-2018 dynamics for the production of wheat and maize (in '000 t)  
Source: authors' own elaboration based on data from the National Institute for Statistics.

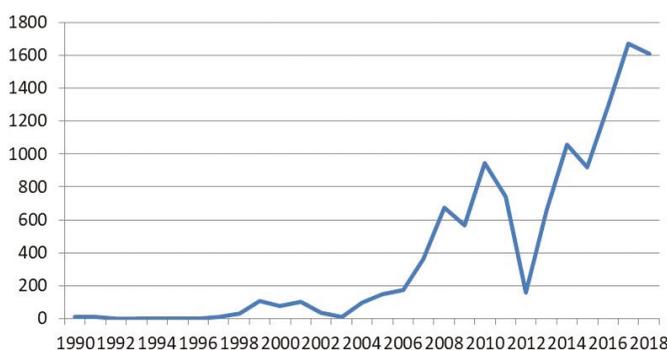
The relatively major fluctuations characterising the two main cereals look to be dependent on climatic conditions, given that irrigation systems were severely damaged at the beginning of the transition to a market economy (Lup and Miron 2015). For each peasant wanted to take home either a few meters of water distribution pipe, or some other elements of the infrastructure supporting the irrigation systems, even if they could not use them for their intended purpose.

Apart from the production of wheat and corn, which stands out given the importance on a European scale, rice production has also been relaunched more recently (Fig. 6). It seems that this cereal can find the specific pedo-hydro-climatic conditions it needs along the Danube, in the lower course of some tributaries, as well as in the delta of the river. Together, these would allow Romania to place third for the production of rice in Europe. Figure 6 shows the dynamics characterising production post-1990, with the large amount of variation clear to see. This contradictory evolution has its origins in the fact that, through to the beginning of 2002, only state-owned enterprises cultivated rice. Their liquidation therefore gave way to two uncertain years, so that, following the purchase of land,

certain areas of rice cultivation could be reconstituted during the communist era. The recent interest of some foreign and Romanian investors in the cultivation of rice could materialise in the establishment of more-extensive specialised commercial companies able to capitalise on existing potential.

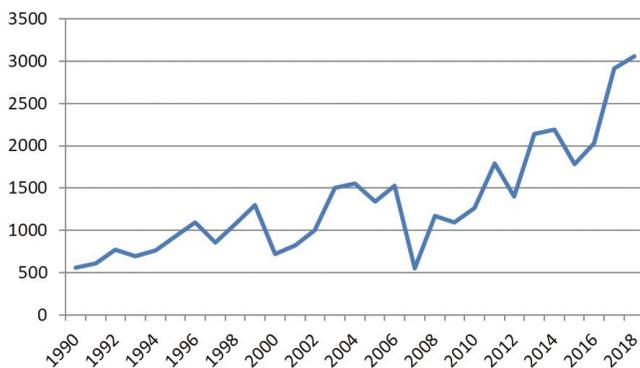
Industrial crops take their major share in the structure for cultivated areas, and among these there are two that would seem to characterise Romania's agriculture. Those are the sunflower (of which Romania is among the top-placed producers anywhere in Europe) and rape (whose cultivation has expanded spectacularly of late when it comes to both the area planted with the species, the area it covers, and the production capable of being achieved. The trend for sunflower-growing has been an upward one (Fig. 7), especially following Romania's integration into the EU (2007). The 2018 level of production was about 6 times as great as in 1990.

A second crop of interest in Romanian agriculture is rape. Under communism and in the first 7 years of transition years, rape was neglected almost entirely (Fig. 8). Thus its cultivation became less significant from 1998 through to 2004. However, the market for biogas ensured stimulation of the growing of this species, with areas involved and output both increasing rapidly in some years. In the figure below it is easy to note a major distur-



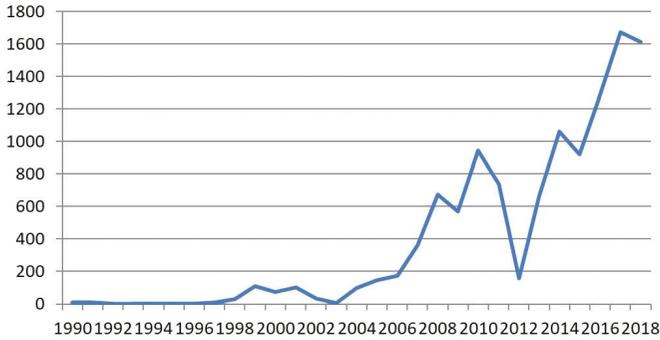
**Fig. 6.** The contradictory dynamics characterising rice production (in '000 t)

Source: authors' own elaboration based on data from the National Institute for Statistics.



**Fig. 7.** The steady increase in the level of production of sunflower ('000 t)

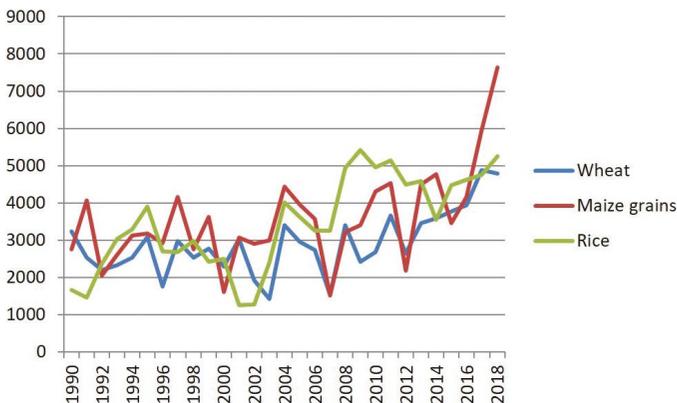
Source: authors' own elaboration based on data from the National Institute for Statistics.



**Fig. 8.** The spectacular increase characterising the production of rapeseed (in '000 t)  
Source: authors' own elaboration based on data from the National Institute for Statistics.

tion between 2010 and 2014. This relates to the arrest and detention for 2 years of the main owner of a Romanian biogas plant. In the wake of that term being served, biogas production based on rape recommenced, with yearly production now standing at around 1.6 million tonnes.

During the transition period, the cultivation of crops of both kinds was associated with significant increases in average production per ha, meaning an increase in the efficiency of agricultural activity. In the case of cereals (as Fig. 9 shows), average production per hectare increased markedly, especially in the period following integration into the European Union. Incentives offered for the growing of cereals under the Common Agricultural Policy were behind jumps contributing to the overall increase in cereal production. For example, per-ha average production was at about 1975 kg of wheat in 2007, compared with 4803 kg in 2018. Similar increases were noted for the production of maize, which increased over the same period from 1526 to 7740 kg. However, as 2018 was an exceptional year, it is more realistic to suggest an average for the years 2016-2018 equal to about 5900 kg/ha. In turn, mean production per ha in the case of rice oscillates quite markedly, even if the sustained trend is upward, with 3263 kg/ha comparing with 5280 in 2018.

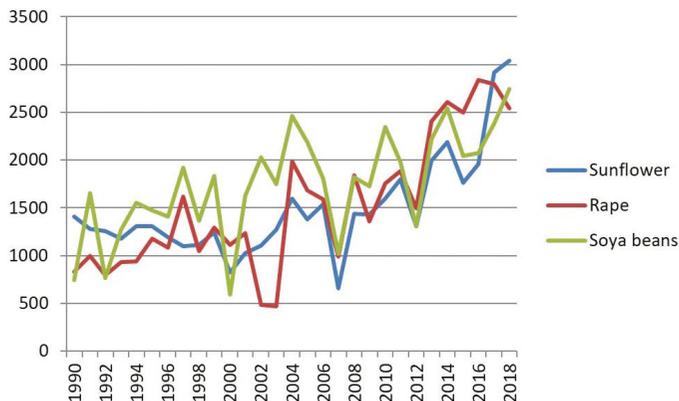


**Fig. 9.** Average yields for the three cereals wheat, maize and rice (kg/ha)  
Source: authors' own elaboration based on data from the National Institute for Statistics.

Much more spectacular increases are recorded for average production per ha achieved over the 1990-2018 period in the case of industrial crops (Fig. 10). Through to the time of integration with the EU, the dynamic for average production of the three most-relevant crops was highly variable, even if this took place against the background of slight growth. After 2007, figures for average production increased steadily, while year-on-year amplitudes reduced greatly. In the cases of all three of the crops, jumps took on spectacular dimensions thanks to the application of new technologies, an increase in the areas irrigated and the existence of a larger number of specialists, especially among the large farms. Thus, mean production of sunflowers increased almost 4.3-fold (from 654 to 2805 kg/ha). The corresponding figures for soybeans and rapeseed were respectively of 2.7-fold (1021 to 2754) and 2.5-fold (991 to 2547).

Certainly, the re-commissioning of irrigation systems once extending over 3.5 million ha would ensure a doubling or even tripling of current average levels of production per hectare, in the cases of both cereals and industrial crops. Current climatic conditions and the rapid change therein (with rainfall distributed to periods other than the growing season) leave the recommissioning and modernisation of irrigation systems as a priority for Romanian agriculture.

Although Romania has major potential for the production of fruit and vines, levels decreased markedly post-1990 in areas engaged in the growing of these two groups of crops. This ensures that these are not yet assets for future development. Rather, local fruit varieties have remained dominant and proved to be of low productivity, while orchards belonging to the enterprises of the communist era have been destroyed. The effect has been to ensure that it is only to the tune of around 35% that domestic production is able to account for the market nationally. In contrast, wine production can meet domestic demand, though intense competition on the market for wine has ensured a decline in areas occupied by vineyards by about 24% – such that the 2018 figure for this was of around 210,000 ha.



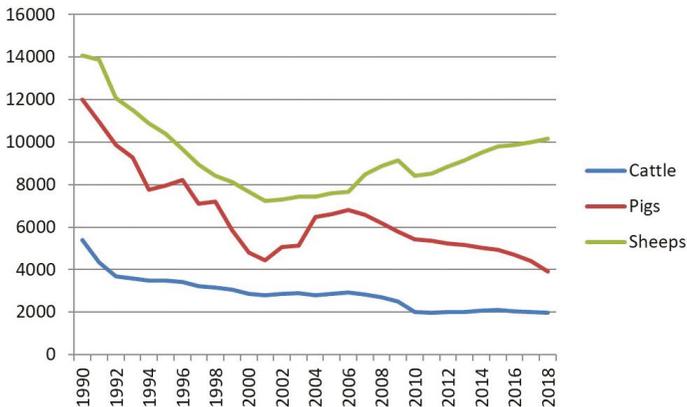
**Fig. 10.** Average (kg/ha) yields for the three industrial crops of sunflower, rape and soy beans  
Source: authors' own elaboration based on data from the National Institute for Statistics.

## Differentiated dynamics for livestock

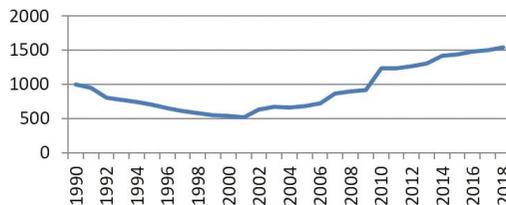
The livestock sector is the second main branch of agriculture, and the trends it manifests reveal the effects of structural changes that have taken place in agriculture, as well as on the national and international agri-food market. The effect of destructuring of communist-era agriculture was felt at the level of livestock farming as a whole, which registered dramatic decreases through to 2000 (Fig. 11). Subsequently, trends differed for the main species of livestock animal. While for cattle, the downward trend continued in an attenuated fashion (with near-stability in more recent times), the category of sheep has witnessed a steady increase in more recent times. This reflects the existence of a very attractive Arab market, as well as the impact of certain government programmes operating in support of sheep farmers.

The evolution of the herd of pigs proves very interesting, as the reaching of a lowpoint in 2001 (at 4.4 million, compared with 12 million in 1990) was followed by an upward trend through to the time of Romania's entry into the EU. After 2007, a decline in the population of pigs was again obvious, to the point where the figure of 3.9 million reached in 2018 represented a historical minimum. This phenomenon reflected a decrease in the price of pork imported from the EU in relation to the price promoted by Romanian farms.

A surprising evolution is that of the population of goats (Fig. 12), which can be explained by at least two factors. First, there has been a lowering of the standard of living



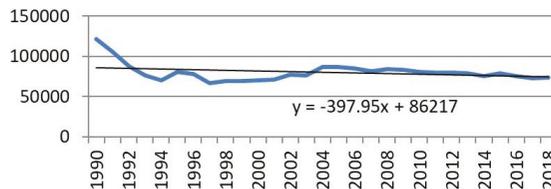
**Fig. 11.** Dynamics characterising the populations of cattle, pigs and sheep (in '000 head)  
Source: authors' own elaboration based on data from the National Institute for Statistics.



**Fig. 12.** A positive evolution of the goat population ('000 head)  
Source: authors' own elaboration based on data from the National Institute for Statistics.

in deeply rural areas, where once every family had a cow, but where today people make do with a single goat! Under the conditions of the abolition of wilderness areas, goats can be raised much more readily, providing the basic food for a family which is usually formed from elderly people! Secondly, goat's milk and derived products are increasingly sought-after on the national and international markets, offering a justification for farms focused on raising goats to emerge.

Compared with the first year of the transition, during which over 12 million population of poultry were registered, 2018 was linked with a population of almost 74 million. As can be seen from Fig. 13. the decline was relatively steep, reaching a low of about 66 million in 1997 (with the abolition of large poultry complexes), followed by a slightly positive trend through to 2004. The decline, which continues, has been at a steady rate that reflects the way in which Romanian producers have failed to maintain an acceptable ratio between price and quality and can hardly face up to European competition.



**Fig. 13.** Searching for balance after a drastic reduction in the population of poultry (in '000 head)  
Source: authors' own elaboration based on data from the National Institute for Statistics.

### Variations in land prices and the land grab in Romania

The evaluation of land prices at national level is extremely difficult, because value is denoted by, on the one hand productive potential, and on the other position and suitability for other uses (housing or industrial construction, tourist arrangements and recreation, etc.). This ensures a very different ratio between supply and demand at national level. Overall, however, the price of land has risen and is rising constantly, as the population becomes aware of the real and prospective value of their land. In the first decade of the transition, the purchase of industrial enterprises at extremely low prices was accompanied by the phenomenon of the purchase of land contributing to the emergence of the first Romanian businesspeople. The speculative nature of purchase of and transactions in land generated many subsequent social problems, accentuating the state of poverty in certain rural areas. The land most sought-after has proved to be arable, especially where highly productive, and/or located in metropolitan and peri-urban areas of major cities.

An examination of the map in Fig. 14 reveals how and prices vary from county to county, with it needing to be recalled how most of are intended for both mountainous or hilly areas, and plain areas. As a consequence, the highest prices reach 8000 euro/ha on average in the plain areas in the west of the country and in its south, with this threshold exceeded around major cities. It is Ilfov County, as part of the metropolitan area of Bucharest, that features the most expensive land.

One of the most interesting phenomena on the land market in Romania involves land grabs that take advantage of either permissive legislation (loopholes) or of the opportu-



as, with a view subsidies from the taxpayer being received. Standing out from among the investors in question are *SC AGRICOST* (of the United Arab Emirates), which manages over 57,000 ha in Brăila County; as well as the Lebanese company *Maria Trading*, which owns the former state enterprise called *Chirnogi* (25,000 ha).

An interesting report that describes the land-grab process in Romania in detail is Szöcs et al. (2015). It *inter alia* mentions factors attracting investors to agriculture, the main categories of investors (banks, insurance companies, multinational companies and private investors), with examples given, including in regard to the geographical areas being invested in. Thus the insurance company *Generalli* and Bardeau Group have invested mainly in Banat (with each having around 70,000 ha overall).

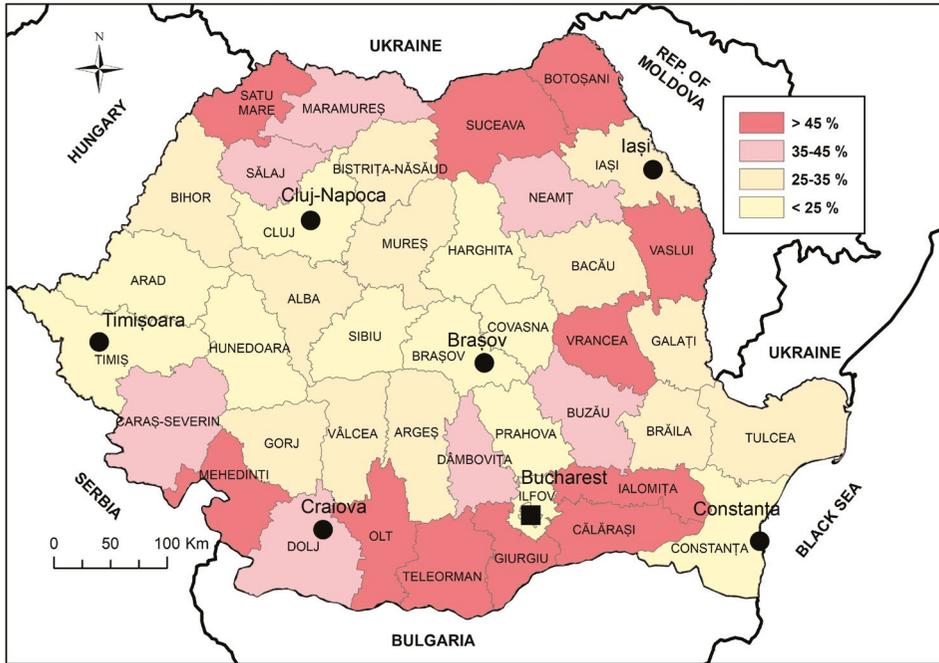
Through to the present day, land grabs have been facilitated by ageing of the population in rural areas, and by the fact that many owners who lived in cities saw land as an actual burden. Local associations managing agricultural activities, apart from the payment of taxes, only offer ridiculous amounts to the owners and this happens very frequently. This made the offer to buy land from certain investors look very tempting, with the result that it was accepted unconditionally. The lack of correct negotiations turns the owner into a safe loser, so it is necessary to build resistance to land grabbing through win-win negotiations (Petrescu-Mag et al., 2017).

### A drastic reduction of the labour force in agriculture

The population occupied in agriculture represents a percentage of 29% nationally, with major variations from one county to another. The highest values are found in some counties located in the north and south, forming a contiguous area with values of over 35% (Fig. 15). The lowest values are in turn noted in the centre of the country, as well as in counties with far-reaching urbanisation, and a prevalence of industrial and service activities (Braşov, Sibiu, Ilfov, Cluj, Constanţa, etc.).

A longitudinal analysis of the labour force in the period covering the 1995-2018 period highlights a massive reduction in numbers of both employees and self-employed workers in agriculture (Table 4). The restructuring of the industry and the process of de-cooperativisation had the effect on increasing the number of self-employed workers in agriculture in the years 1990-1995, to the point where the number reached some 4.4 million people. The downward trend reached the 4-million threshold in 1996, after which a second major step in deindustrialisation took place, in this way renewing an increase back to the initial level from 2000 on. Subsequently, the decrease accelerated, such that there are now some 1.75 million self-employed workers. A similar path has described the number of employees in agriculture, which decreased steadily from about 560,000 people in 1995 to 268,000 in 2018 (Table 4).

The large numbers of those who work on their own land relate closely to the degree of fragmentation of agricultural holdings, as well as very limited mechanisation of agricultural activities. External migration has led to a substantial reduction in numbers of young farmers, who have abandoned small farms for a decent income. Unfortunately, neither the Common Agricultural Policy nor the Romanian state grant subsidies for small farms, which are forced to operate on the basis of bank loans. However, Romanian agriculture still provides work for a high proportion of the country's population, even if only at a low level of productivity, because the income gained helps diminish the poverty felt tangibly in the most-disadvantaged areas (Tocco et al., 2016).



**Fig. 15.** Shares of county populations occupied in agriculture

Source: author's own elaboration based on data from the National Institute for Statistics.

**Table 4.** Trend for the labour force in agriculture ('000 people)

Years	1995	1996	2000	2005	2010	2015	2018
Employees	556.3	552.9	444.4	353.2	284.1	266.8	268.3
Self-employed	4372.6	4047.7	4391.9	2756.0	2535.1	1984.5	1747.5

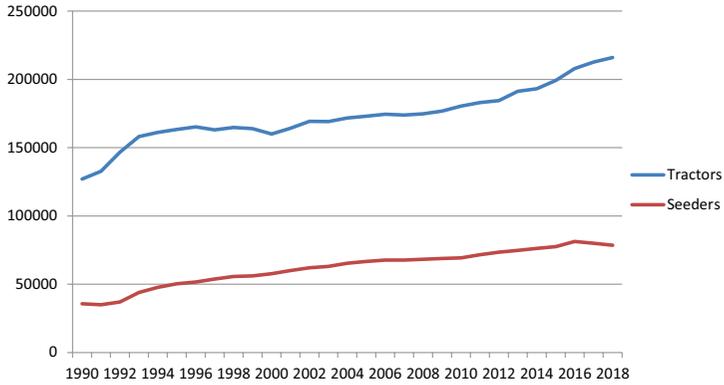
Source: author's own elaboration based on data from the National Institute for Statistics.

### The steady, selective improvement of tools and technology in agriculture

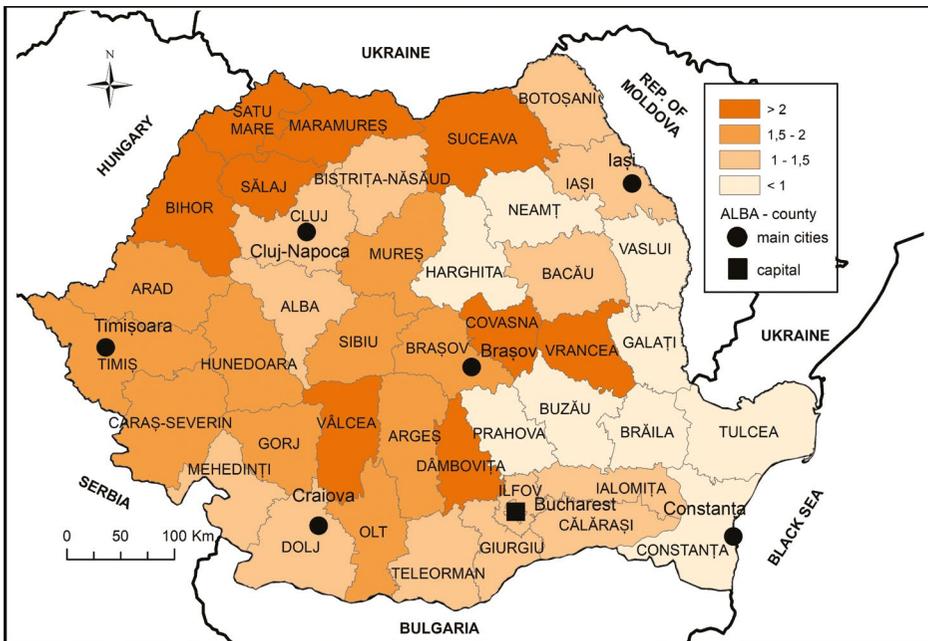
One of the main drivers of structural change in agriculture is represented by technical tools and the adoption of new technologies. This issue should be seen together with the new priority of the Common Agricultural Policy focused on sustaining rural development and preventing the abandonment of agricultural activities (Neuenfeldt et al., 2019).

In measuring the process by which existing technical tools in agriculture are improved, we used only two indicators at the outset, i.e. trends for numbers of tractors (including also the associated mechanical seeders) and for amounts of fertilisers used. Where tractor numbers are concerned, it is easy to observe a permanent increase through the transition period (Fig. 16). A similar trend was likewise registered for mechanical seeders. These values are achieved due to private companies in agriculture and medium-sized (20- to 50-hectare) individually-owned farms, and only incidentally thanks to small farms.

To provide insight into territorial distribution, and to measure the degree to which demand is met, the map in Fig. 17 shows numbers of tractors per 100 ha, by counties. The



**Fig. 16.** Change over time in numbers of tractors and mechanical seeders (1990-2018)  
 Source: authors' own elaboration based on data from the National Institute for Statistics.



**Fig. 17.** Distribution of tractors/100 ha, by counties (2018)  
 Source: authors' own elaboration based on data from the National Institute for Statistics.

highest values are noted in counties with a high level of relief fragmentation and a low proportion of arable land (Maramureş – 3.4 tractors/100 ha, Suceava, Covasna, Vrancea, etc.). The lowest values are registered in south-eastern Romania, grouping Constanţa, Tulcea, Galaţi, Brăila and Buzău counties, which are well known for their valuable arable land.

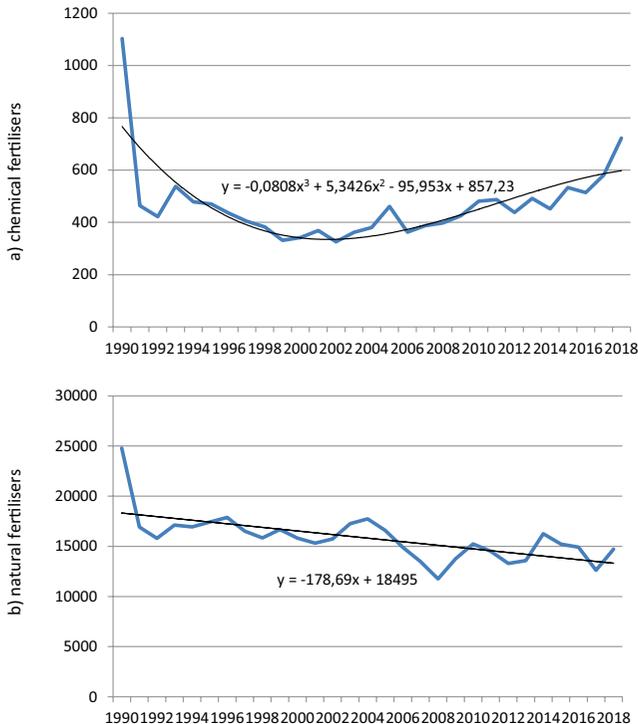
To help ensure improved performance of Romanian agriculture, a key role is played by incentives such as fertilisers, as well as plant-treatment technologies. Our analysis focused on the quantitative and structural dynamics relating to the use of chemical fertili-

sers. Figs. 18a and 18b allow for comparisons of the evolution in quantities of chemical and natural fertilisers being applied at national level during the whole transition period.

While the first two years of the transition period saw usage of chemical fertilisers collapse to just around a third of the previous level, there followed a period of some 15 years in which amounts consumed in agriculture remained more or less constant. An upward trend then became noticeable from 2002, only for this to become accentuated very clearly in more-recent years. In parallel, a slow but steady decline in the use of natural fertilisers in agriculture is to be noted.

Judging by the trends pertaining to sources of nutrients of the above two categories, it is reasonable to suggest that Romanian agriculture is moving in an unsustainable direction, as it returns to using large quantities of artificial fertilisers and gradually gives up on the use of natural manuring. Where the trends to go on intensifying, this would leave the organic production as little more than a slogan.

An important tool helping to maintain and improve agricultural productivity is the national irrigation system, as combined with efforts to combat degradation of the land. The irrigation system operated over some 3.5 million ha prior to the collapse of the old political regime. Today, the irrigated area is at only one-tenth (9.8%) of the initial designated area. When actually irrigated areas at county level are set against the overall area arranged for irrigation, it is possible to note a major handicapping of regions recently more and more afflicted by prolonged periods of drought. Climate change and the estimated



**Fig. 18.** Differences from year to year in amounts of chemical and natural fertilisers being used (tonnes)  
 Source: author's own elaboration based on data from the National Institute for Statistics.

decline in agricultural production for 2020 show how necessary it will be to re-equip areas formerly benefiting from irrigation.

More generally, massive deforestation in both hilly and mountainous areas, as well as on the plains, has accentuated the processes of soil and land degradation. Through erosion due to increasingly torrential flows, especially in small river basins in hilly areas; as well as landslides; a great deal of agricultural land is being rendered unproductive. Even worse is the way that a re-acquisition of ownership in fragile plain areas coincided with the clearing of forests by new owners, with desertification setting in and intensifying in the country's south west and south east (Dumitraşcu et al., 2018; Prăvălie et al., 2014; Sima et al., 2015). Unfortunately, investments in applied research do not meet need, with action to arrest land degradation actually less impressive than in earlier times.

Technical tools and new technologies have nevertheless been nurturing slow development of agriculture productivity, with results expressed clearly in terms of improved average yield per hectare. In a previous analysis, we noted this indicator at a level two or three times higher (in the cases of wheat, maize, sunflower, rape, etc.). Compared with other economic branches, agriculture always manifests a delay in achieving productivity increases. Furthermore, technological progress occurring in industry and services feeds through into comparatively more limited progress with agriculture productivity. For example, between 1995 and 2017, agriculture's share of productivity nationally decreased from 45.1 to 20.4% (Table 5).

In the whole period following Romania's EU accession, agriculture's share of national productivity has been somewhat above or below 20%. Differences have reflected weather on the one hand and the progress made in other economic branches on the other.

This analysis concludes by suggesting that a greater degree of modernisation of agriculture is now being achieved, even as this is unable to bridge the productivity gap noted where Romania is compared with developed European states or even former-communist ones.

**Table 5.** Agricultural productivity as a percentage of average productivity in the Romanian economy

Years	1995	2000	2005	2010	2012	2014	2017
Share of productivity accounted for by agriculture	45.1	26.8	28.2	17.3	17.4	18.2	20.4

Source: authors' own elaboration based on data from the National Institute for Statistics.

### Challenges for Romanian agriculture

A critical issue in the sustainable development of agriculture would be for quality of life in Romanian villages to be raised more fully in line with European standards (Borja and Borja 2014). This kind of rural development (as conceived broadly though obviously including agriculture) requires an integrated vision for upcoming years that as necessary re-interprets existing strengths and opportunities represented by the CAP, as well as the structural dynamics present on international agricultural markets. The need for this vision starts from the way that "46% of the active population lives in villages, and about 60% works in agriculture" (Kerkes 2010, p. 46).

The current structure, and degree of development, of Romanian agriculture point to key challenges to reduce the influence of restrictive factors and allow for rapid achie-

vement of structural change in this important branch of the economy, with technologies and innovations further incorporated as necessary.

Among the most important challenges facing Romanian agriculture are:

- 1) To further optimize the sizes of holdings.** This is a very complicated process because the fragmentation of land has a tradition, but one arising out of necessity, given the high proportion of the Romanian population that is rural, the remnant thinking about land as a safe way to ensure food security for rural families, and the lesser predictability of the economy. Statistically speaking, the average area of “farms increased from 3.11 to 3.65 hectares between 2002 and 2016” (Bularca and Tome 2018, p.62), albeit with this trend reflecting an increase in the area and number of farms covering more than 100 ha. It is clear that, with a large share (over 75%) of farms covering less than 2 ha, a high level of performance in agriculture is not possible, even as a large number of farms exceeding 100 ha in area cannot ensure a real sustainable development of rural communities. The current agricultural land structure thus represents a huge economic and social problem for the decision-makers at central and local levels (Oțiman 2012). In the main, the profit achieved by the main investors is not directed to rural local development, but rather heads for Romanian cities or other countries. The country’s legislation in this area is too permissive, featuring no maximum size limits for farms, and thus facilitating the concentration of land in few hands – mainly originating in other regions of the country or elsewhere in the world. If farm size is to be optimized, account will need to be taken of the historical process of rural development, which could be accelerated by authorities stimulating critical points. Thus, for example, a solution might be to stimulate association between small farmers, who each nevertheless retain their individual property. This would entail a rethink of current legislation, with assured access of associated owners to domestic and EU financial support for the further development of their affairs.
- 2) To facilitate young farmers’ access to special programmes of financing, as well as training projects.** These programmes can underpin successful agricultural activity and, would thus work to resolve the crucial problem of rural development that is the depopulation of villages: by making agriculture more attractive. However, the fact of small farms being confined to physical work (given that only 2% of Romania’s farms have a tractor – Nițescu and Dobre-Baron 2018) ensures the total inefficiency of agricultural activity, even where the goal is little more than subsistence for a medium-sized rural family. Latest trends in agricultural development can represent added value in this regard, thanks to ICT (Dovleac and Bălășescu 2016), and a consequent contribution to raised innovative and creative potential among young farmers. The latter’s participation in the exchange of ideas on agricultural development internationally could help raise levels of personal professional satisfaction, especially where new knowledge impacts upon economic performance.
- 3) To ensure the development of alternative economic activity in agricultural areas.** Starting from the reality that agricultural activity is of a seasonal nature – ensuring periods in which the cultivation of plants is paused, programmes of rural development must stimulate small-scale entrepreneurship, capitalising on certain agricultural products through the development of such services as tourism and leisure. At the same time, the evaluation of existing non-agricultural resources in rural communities can

allow for the development of activities ensuring sustainable economic growth and stimulating investment in agriculture via newly-created funds.

- 4) To encourage the development of agricultural service cooperatives.** The huge numbers of individual farms more likely to persist over time need to cooperate among themselves, as well as with other investors, to ensure the establishment and development of a systemic food chain. The urgent need for Romania's small and medium-sized farms is to develop warehouses for grain, vegetables and fruits, as well as centres for the collection of milk, wool and honey. In deeply-disadvantaged agricultural areas, the establishment of mechanised assistance points works for some, increasing crop yields on small farms. The first steps towards this have been taken in recent years by the National Association of Food Cooperatives and the National Union of Cooperatives in the Crop Sector (Wolz et al. 2020), and this can help small, specialised farms with production and sales.
- 5) To ensure new opportunities up to the limits of the market for biofuels.** Romanian agriculture has major potential to develop the growing of crops for the production of biofuels (Stan et al. 2014), with this therefore capable of setting a new strategic direction for further investment. The European Commission promotes biofuel production, but with caution, as key operators in farming may prove more interested in developing these kinds of industrial crops, as opposed to food. However there are discussions surrounding the ethical issues of biofuel production, given – for example – the major growth of rapeseed cultivation on some of Romania's large farms. It is therefore very that this kind of orientation be monitored to ensure that no effect on food security arises.
- 6) To renew the effort to achieve capitalisation on small and medium-sized holdings.** Analysis at the current stage of capitalisation of holdings points to a lower level of mechanisation on small farms, difficulties with accessing financial resources (including EU funds), the non-functionality of the irrigation system, and a lack of specific infrastructure operating in support of produce and products. The main issue is then to change the current policy the CAP promotes, which is helpful where major investors seek to develop their affairs, even as it does little or nothing for small farmers, who should be able to survive in circumstances of unethical competition. Facilitation of small farmers' access to European and domestic funds would put in place conditions for standards of living in rural areas to be maintained and developed.
- 7) To promote the development of intensive agriculture by increasing resources of greenhouses and solaria.** To ensure that the huge demand for fresh vegetables during winter is met, and to account for the anticipated effects of climate change on vegetable production, it is necessary for the area in which protected cultivation can be engaged in to be increased. Such investment could be considered one of the most efficient low-season activities alternative to field agriculture.
- 8) To intensify cooperation with other European states to ensure implementation of most-recent farming innovations.** The focus here is on new methods, technologies and tools by which agricultural productivity may be raised. ICT, GIS, and the use of satellite imagery or drones could all surely reduce the still-growing disparities that separate Romanian agriculture from similar activities in the EU's more-developed countries. Extensive use of the Internet as a source of information and knowledge is a first step if Romania's farms are to be managed better. Yet in other formerly-commu-

nist countries this has become common practice (Jank et al. 2019). A redevelopment and reorientation of agricultural research would have an important role to play here, with financing for this raised both publicly and privately to facilitate access to pan-European best practice.

**9) To make agriculture sustainable.** As Romania is very interested in working to preserve the productive capacity of its soil and land, that denotes promotion of the most environment-friendly practices in agriculture. On the European scale, the market for organic products is expanding steadily, and Romania has clear potential to develop a new kind of agriculture in that context (Popovici et al. 2018). If large farms focus in on large-scale industrial-type production, that could leave small and medium-sized farms free to find their important niche in developing organic production. Operating on their small scale, individually-owned farms use manuring and apply fewer pesticides, therefore ensuring a higher quality of the environment (Otiman 2006). Romanian villagers have tended to respect the environment. To the extent that their engagement in agricultural activity has over time ensured a healthy life. But the promotion of agricultural sustainability denotes major resources being allocated to infrastructure, as well as the training of farmers.

## Conclusions

Our analysis confirms the huge European-level agricultural potential of Romania, which could join Poland in together covering about one-third of Europe's entire demand for food. However, Romanian agriculture at its present stage is characterised by a major disparity as regards productivity, by comparison with both the EU's developed countries and even most of the formerly-communist ones. There is some progress, however, suggesting convergent trends, especially at the national level.

Yet there are huge problems generated by the far-reaching land fragmentation (with over 3.5 million agricultural holdings. Further problems relate to excess labour force in rural areas – encouraging the emigration of the young population, as well as the rudimentary nature of tools and equipment, and a lack of agricultural services. At the same time, a balance needs to be found between the population in rural areas and their possibilities of engaging in complementary agricultural activity, designated for own consumption. A major further issue relates to farms of between 1-5 ha, which are worked with farmers' own means, and are not sustained by specific programmes promoted at national or EU levels.

Romania has an important potential when it comes to the production of certain cereals and industrial crops well adapted to the edaphic and climatic conditions. Species involved here are wheat, maize, sunflower and rape. Looking to the European hierarchies, Romania tops the ranking for the crops mentioned, while enjoying prospects to become involved with other crops not specific for this geographical area (like rice). The huge resources of pastures and meadows also make livestock farming a certainty for development, especially when it comes to the raising of cattle, sheeps and pigs.

The key critical points when it comes to further investment entail the weak development of agricultural infrastructure and services. And, with a deficient irrigation system facing more and more accentuated drought, and with an incomplete chain for the proces-

sing of agricultural products, targets set for policy domestically and Europe-wide remain far from being achieved.

In our above analysis, we have set out some of the challenges Romanian agriculture faces. A key aspect now is to combine together actions oriented at one and the same time to the training and education of young people in the countryside, as well as programme-mediated work seeking to ensure that people remain – and continue to work – in their villages. Efforts to help with enhanced access to ICT, and to create rural centres hosting the professional meetings that will debate farming's current individual-level and collective problems, would not seem over-expansive if decision-makers on different levels adopt forward-looking visions.

The expectations of the rural population in the next EU funding period are in fact far greater now, with two decades of European integration in prospect (by 2027). But tools are at the disposal of European, national and local authorities, as well as rural inhabitants themselves, who should act synergistically to transform Romanian agriculture in the direction of a higher level of performance, with a rapid improvement in living standards in the countryside achieved in the process.

### 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.

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