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## **STRUCTURAL CHANGES IN THE AGRICULTURAL HOLDINGS OF LEGAL PERSONS IN THE PRE- AND POST-ACCESSION PERIOD (1996-2010)**

### **Abstract**

*In this paper an attempt was made to analyse the changes in the agricultural holdings of legal persons in the period 1996-2010, taking into account the pre- and post-accession period. In the analysed period, the agricultural holdings of legal persons, after the rapid and profound changes in the ownership, as well as the legal and organizational structure in the first half of the 90s, were still subject to a profound restructuring. The effects of this process, however, were significantly different in the pre- and post-accession period. The article presents the basic structural changes in the whole farming sector of legal persons, including the various legal and organizational forms. The analysis concerned the changes: in the number of agricultural holdings and agricultural land in their use (including holdings with agricultural activities, in the area structure, in the spatial distribution of holdings by provinces, in the orientation of agricultural production, in the economic size and the labour input. The analysis was based on data from PSR 1996, 2002 and 2010, as well as the literature.*

**Keywords:** structural changes, agricultural holding, post-accession period, pre-accession period, state-owned farms, legal person.

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### **Introduction**

Farms operated by legal persons constitute an important segment of agriculture both in “old” and “new” EU Member States. In most of EU-15 countries

their share in the total number of farms and in the area of land used by them increases<sup>1</sup>. However, this share is very strongly diversified – it is highest and growing fast in France, high and also increasing in Germany<sup>2</sup>, it also increases fast in Denmark<sup>3</sup>. In Poland the sector of legal farms, following a substantial regress and fundamental changes to its legal and organisational structure in 1990-1996 and the significant decrease<sup>4</sup> in the pre-accession period, has been clearly entering the path of growth over the recent years. However, the research on changes taking place on these farms has been very poor so far. Scientific research and publications have rather concentrated on forms and directions of distribution of assets of dissolved former state-owned farms (PGR) and efficiency of farming in selected groups of farms created with post-PGR assets. Fragmentary analyses have been undertaken on the basis of the “Ranking” of agricultural enterprises and a group of legal farms studied under Polish FADN. There was no previous attempt at the more comprehensive analysis of changes from a dynamic perspective in the entire sector of legal persons, taking into account various legal and organisational forms of farms and their sizes, as well as the change of share of these farms in use of agricultural land, labour force, capital resources, as well as in terms of agricultural production and farming efficiency.

Such an attempt has been initiated with an article entitled “Transformation processes on farms of legal persons in 1990-1996” published in the previous issue of “Problems of Agricultural Economics” quarterly. This study attempts to analyse the basic structural changes (in the number of farms and area structure, share of farms with agricultural activity, spatial distribution, types of agricultural production, economic size and labour input)<sup>5</sup> in the sector of farms of legal persons in the pre- and post-accession periods. Due to a limited framework of this article, the analysis of the efficiency of farming against the backdrop of changes in the level and structure of production has been left for a separate study. The analysis presented has been based on data from NAC from 1996, 2002, 2010 and source literature.

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<sup>1</sup> In 2003-2010, in EU-15 countries, the share of farms of legal persons in the total number of farms increased from 4.2% to 5.6%, while the share of agricultural land used by such farms increased from 26% to 29%.

<sup>2</sup> In 2003-2010, in France, the share of legal farms in the total number of farms increased from 21.7% to 29.2%, in the agricultural land from 46.4% to 57.7%, while in Germany from 5.7% to 8.7% and 31.0% to 33.6% respectively.

<sup>3</sup> In Denmark, only in 2003-2007 the number of farms operated by legal persons increased by nearly 40% and the area of land used by them by 75%.

<sup>4</sup> In connection with the still ongoing process of privatisation of state-owned farms and assets (including agricultural land in particular) from dissolved PGRs.

<sup>5</sup> The analysis of changes in inputs of fixed and current assets has been omitted due to the fact that the use of available indicators (e.g. average equipping with farm buildings or machinery and tools) may lead to wrong conclusions in connection with significant changes in the sector when it comes to the simplification and specialisation of production and the increase in servicing.

## **Changes in the number and structure of farms of legal persons and the agricultural land used by them**

### ***Farms in total***

After profound changes in the number and structure of farms of legal persons in the period of intense systemic changes (1990-1996)<sup>6</sup>, before Poland's accession to the EU, the trend continued to be visible of decrease in the number of such farms (in 1996-2002 from 6403 to 4650, that is by above 27%), which varied very strongly depending on their ownership and organisational form (Table 1). The number of state-owned and cooperative farms decreased most<sup>7</sup>, by 52% and 50% respectively. The number of private domestic commercial law companies also decreased (although slightly, by less than 3%). On the other hand, the number of farms with foreign or mixed ownership (typically functioning in the form of commercial law companies) increased significantly, by as much as 56%; there was also a nearly 29% increase in the number of private domestic farms other than cooperatives for agricultural production (Spółdzielnie Produkcji Rolnej – SPR) or companies (i.e. farms belonging to various types of institutions, e.g. churches, religious organisations, foundations, etc.).

After Poland's accession to the European Union and inclusion of Polish agriculture in the Common Agricultural Policy (CAP), the strong tendency for shrinking of the sector of farms of legal persons (lasting from the beginning of the system transformation) was substantially slowed down (Table 1). In 2002-2010 the number of such farms decreased from 4650 to 4329, i.e. by ca. 7%. The average annual pace of decrease in the number of farms under analysis dropped from 4.6% in 1996-2002 to 0.9% in 2002-2010 (from 292 to 40 farms). The diversification of direction and pace of changes depending on ownership or legal and organisation form of farms under analysis significantly deepened in this period. Although the dynamics of decrease in the number of state-owned and cooperative farms has significantly decreased, at the same time a very large increase in the number of farms organised in the form of domestic ownership companies has been recorded; a very high level of increase of the number of farms with foreign or mixed ownership has been sustained. A clear tendency has emerged of decrease in the number of municipal and other private farms, the number of which (municipal in particular) had been very dynamically increasing in the previous period.

As a result, there have been very large changes in the structure of legal farms. Over the entire period under the analysis, and particularly in the post-accession period, the share of state-owned and cooperative farms has decreased substan-

<sup>6</sup> The analysis of the restructuring process of agricultural holdings of legal persons in 1990-1996 was presented in the article published in the "Problems of Agricultural Economics" quarterly, issue 2/2014.

<sup>7</sup> This group includes cooperatives for agricultural production (SPR), the core of which are agricultural production cooperatives (Rolnicze Spółdzielnie Produkcyjne – RSP) and farms of agricultural trade organisations (typically these are former collective farms of machinery sharing rings: Zespoły Gospodarstwa Rolne Kółek Rolniczych – ZGR KR).

tially, while the share of private domestic (except SPRs) and foreign farms has strongly increased (Table 1).

Table 1  
*Changes in the number and structure of farms of legal persons in 1996-2010*

Farms	1996		2002		2010		Dynamics		
	number	%	number	%	number	%	2002/ 1996	2010/ 2002	2010/ 1996
Total	3066535	100	2933228	100	2277613	100	95.7	77.6	74.3
Natural persons	3060132	99.79	2928578	99.8	2273284	99.8	95.7	77.6	74.3
Total legal persons	6403	100	4650	100	4329	100	72.6	93.1	67.6
Public	2016	31.5	1266	27.2	920	21.3	62.8	72.7	45.6
- state-owned	1953	30.5	935	20.1	679	15.7	36.7	72.6	34.8
- municipal <sup>a</sup>	63	1.0	331	5.0	241	5.6	525.4	72.8	382.5
Private domestic	4251	66.4	3172	68.2	3132	72.3	75.0	98.2	73.7
- SPR	2467	38.5	1238	26.6	837	19.3	50.2	67.6	33.9
- domestic companies	1155	18.0	1124	24.2	1749	40.4	97.3	155.6	151.4
- other	629	9.8	810	17.4	546	12.6	128.8	68.2	86.8
Foreigna	136	2.1	212	4.6	277	5.4	155.9	141.3	203.7

<sup>a</sup> and mixed ownership.

Source: Own calculation and specification based on: (Dzun W., Dzun P. 2013); Systematyka i charakterystyka gospodarstw rolnych, PSR 1996, Central Statistical Office (GUS), Warsaw 1998; Systematyka i charakterystyka gospodarstw rolnych, PSR 2002, Central Statistical Office (GUS), Warsaw 1998; Charakterystyka gospodarstw rolnych, PSR 2010, Central Statistical Office (GUS), Warsaw 1998; unpublished GUS data.

The decrease in the number of legal farms has been accompanied by the decreasing area of agricultural land used by them (Table 2). Over the entire period under analysis the area of agricultural land in this sector decreased by 32% (in 1996-2002 by 24.7% – 4.1% annual average, while in 2002-2010 by 9.7% – 1.2% annual average). The decrease in the area of agricultural land in the pre-accession period was slightly lower than the decrease in the number of farms, while in the post-accession period it was slightly higher. As a result the average area of agricultural land per farm did not change in principle: in 1996 it amounted to 423 ha, in 2002 to 439 ha and in 2010 to 426 ha. However, the direction and dynamics of these changes significantly varied between individual groups of farms under analysis (Table 2). Both in the pre-accession and post-accession period the largest decrease in the area of agricultural land was recorded among state-owned farms, which was due to continued privatisation of the Agricultural Property Stock of the State Treasury. It should be noted though that the average annual decrease of agricultural land on these farms in the post-accession period was already much lower than in the previous period (6.6% and 5% respectively). In total, in 1996-2010 the area of agricultural land of these farms decreased by more than 55% and their

share decreased from 46% to 30%. The decrease in the area of agricultural land was slightly lower in SPRs, particularly in the post-accession period – the area of agricultural land decreased by 50%, and its share in the total area of the sector decreased from 18.5% to 13.5%. On the other hand that was a strong and increasing upward trend in the group of other private domestic farms (except for SPRs and companies). The area of agricultural land in these farms increased by 3.4 times, but their share in the total area of agricultural land continues to be small and amounted to 3.3% in 2010. The similar trend, though not with such a large growth dynamics, has been seen in the group of farms with foreign or mixed ownership. The area of agricultural land in these farms increased by 55.6 times and their share in the total area of agricultural land was significant and amounted to 10% in 2010.

Table 2

*Changes in area and structure of agricultural land (UAA) on farms of legal persons in 1996-2010*

Farms	1996 <sup>b</sup>		2002		2010		Dynamics		
	number	%	number	%	number	%	2002/ 1996	2010/ 2002	2010/ 1996
Total	17348.3	100	16899.3	100	15503.0	100	97.4	91.7	89.4
Natural persons	14639.1	84.4	14858.4	87.9	13660.4	88.1	101.5	91.9	93.3
Total legal persons	2708.9	100	2040.9	100	1842.6	100	75.3	90.3	68.0
Public	1249.1	46.1	933.5	45.7	566.9	30.8	74.7	60.7	45.4
- state-owned	1242.2	45.9	916.7	44.9	522.7	30.0	73.8	60.3	44.5
- municipal <sup>a</sup>	6.4	0.2	16.8	0.8	14.2	0.7	262.5	84.5	196.9
Private domestic	1341.9	49.5	968.3	47.4	1092.3	59.3	72.2	112.8	81.4
- SPR	501.6	18.5	323.9	15.9	248.7	13.5	64.6	76.8	49.6
- domestic companies	822.2	30.4	623.1	30.5	782.3	42.3	75.8	125.5	95.1
- other	18.1	0.7	21.2	1.0	61.3	3.3	117.1	289.2	338.7
Foreign <sup>a</sup>	117.9	4.4	139.0	6.8	183.4	10.0	117.9	131.9	155.6

<sup>a</sup> and mixed ownership; <sup>b</sup> Total area of agricultural land without land not constituting agricultural holdings (371.1 thousand ha in the public sector and 221.2 thousand ha in the private sector) and without estimation of agricultural land not included in the NAC.

Source: Own calculation and specification based on: (Dzun W., Dzun P. 2013); Systematyka i charakterystyka gospodarstw rolnych, PSR 1996, GUS, Warsaw 1998; Użytkowanie i jakość gruntów, PSR 1996, GUS, Warsaw 1997; Użytkowanie gruntów, powierzchnia zasiewów i pogłowie zwierząt gospodarskich, Warsaw, June 2003; Systematyka i charakterystyka gospodarstw rolnych, PSR 2002, GUS, Warsaw 2003; Charakterystyka gospodarstw rolnych, PSR 2010, GUS, Warsaw 2012 and unpublished GUS data.

The analysis of transformations presented above shows clear distinctions not only between public and private farms, but also very big ones between individual groups of private farms. The changes in the group of cooperative farms are most “obvious”. In general new cooperative farms are not established, while economically weak, typically small farms, drop out from the group of existing SPRs, so the

number of cooperatives decreases faster than the area of agricultural land at their disposal. As a result, there is a very clear upward trend in terms of the average area of an SPR – from 203 ha in 1996, to 262 ha in 2002 and 297 ha in 2010.

On the other hand, the trend is opposite in the group of companies. The average area of farms clearly decreases – from 712 ha in 1996 to 554 ha in 2002 and 447 ha in 2010. It is primarily the result of establishing farms run by companies which are smaller and smaller in terms of the area (large farms to be leased from the Agricultural Property Stock of the State Treasury are no longer available), the division of companies and the withdrawal by the Agricultural Property Agency some of leased land from the Agricultural Property Stock of the State Treasury for the purpose of enlarging farms of individual farmers.

The very interesting changes took place in the post-accession period in the group of other private farms. In the group the average (small in general) area of farms in the pre-accession period was becoming even smaller (from 29 ha in 1996 to slightly over 26 ha in 2002), while in the post-accession period, as a result of a substantial decrease in the number of farms, with a simultaneous significant increase of the area of agricultural land, it suddenly increased to 112 ha. This is probably the result of the concentration process, caused by unprofitability of agricultural production targeted at minimisation of labour input with a small area of a farm.

The processes presented above have been reflected in the changes of the number and structure of farms according to the size groups. Both in the pre- and post-accession period the group of farms with very small area up to 5 ha of UAA decreased much faster than the number of farms run by legal persons in general. A similar trend, although much weaker, particularly in the post-accession period, could be observed in the group of farms with above 1000 ha of agricultural land. This was primarily due to privatisation of state-owned farms (PGRs). But the principal difference between the pre- and post-accession period was visible in the trends of changes in the remaining area groups. In the pre-accession period the group of farms between 5 and 20 ha grew very strongly. This resulted primarily from a substantial increase of the number of municipal and other domestic private farms, connected with the flow of land from the Agricultural Property Stock of the State Treasury. On the other hand, in the post-accession period, the number of farms between 30 and 500 ha grew strongly, primarily as a result of an economic mechanism, as with growing specialisation of most of farms run by legal persons in production of cereals and rape, expected results were achieved by large-sized farms.

As a result the area structure of legal farms improved substantially. First of all, the share of farms with very small area (up to 5 ha) decreased by over 2 times – from 23.8% in 1996 to 17.8% in 2002 and 11.3% in 2010. At the same time the share of farms with largest areas, 1000 ha and more, slightly decreased – from 9.4% to 8.3%. The share of other medium and large farms (10-500 ha) significantly increased, particularly in the range of 50-500 ha – from 57% to

68%<sup>8</sup>. The structure of agricultural land according to area groups became even more advantageous (Table 3). In 2010 only 0.2% of total agricultural land was in the small-sized farms' possession (having up to 10 ha of agricultural land), while as much as 99.3% were in possession of large farms i.e. above 30 ha (including as much as 97% in farms with more than 100 ha of agricultural land)<sup>9</sup>.

Table 3

*Structure and average size of farms of legal persons in total per area groups and basic legal and ownership forms of such farms in 2010*

Farms	Total	Area groups in hectares of agricultural land, share in %								Average area in hectares of agricultural land
		Up to 1	1-5	5-10	10-20	20-30	30-50	50-100	≥100	
Total	2277613	31.4	37.8	15.4	9.9	2.7	1.6	0.8	0.4	6.8
including: natural persons	2273284	31.4	37.9	15.5	9.9	2.7	1.6	0.7	0.3	6.0
Total legal persons	4329	3.2	8.1	6.5	7.2	4.2	6.0	10.3	54.7	425.6
Public	920	2.0	8.9	6.6	8.4	5.7	8.6	13.9	46.0	616.2
- state-owned	679	1.2	3.1	4.3	6.3	4.9	8.2	14.7	57.3	814.0
- municipal <sup>a</sup>	241	4.1	25.3	13.3	14.1	7.9	9.5	11.6	14.1	52.3
Private domestic	3132	3.3	8.3	6.7	7.2	3.9	5.2	9.4	56.1	348.8
- SPR	837	1.3	3.8	3.1	5.1	2.3	4.5	11.7	68.1	297.1
- domestic companies	1749	4.5	5.4	3.4	4.2	2.8	4.5	9.0	66.2	447.3
- other	546	2.6	24.4	22.7	19.6	10.1	8.4	7.0	5.3	112.3
Foreign <sup>a</sup>	277	5.8	3.2	3.2	3.2	2.2	6.5	8.3	67.5	662.1

<sup>a</sup> and mixed ownership.

Source: Own calculation and specification based on: as in Table 2.

The area structure of farms of legal persons is strongly diversified depending on legal and organisational forms of farms (Table 3). The other private domestic farms and municipal farms are characterised by the most fragmented area structure. In 2010, farms small in terms of area (up to 10 ha) in the former group accounted for nearly 50%, in the latter nearly 43%, while in the remaining groups of farms this share was several times lower (in cooperative farms 8.2%, state-owned 8.6%, foreign and mixed 12.2% and domestic companies 13.3%). At the same time the share of farms with more than 100 ha was relatively low in the structure of these two groups (5.3% in other domestic and 14.1% in municipal),

<sup>8</sup> For comparison: in the sector of farms of natural persons, the share of farms with very large area (without exclusion of farms with an area of 1000 ha and more) amounted to 1.2% in 2010.

<sup>9</sup> In this respect, the situation on farms of natural persons was dramatically different, these shares amounted to respectively 36.2% and 30.4% (including 12.2% for over 100 ha).



while in state-owned farms it amounted to 57% and ranged 66-68% in companies, SPRs and foreign-owned ones.

The structure of agricultural land by area groups is characterised by clearly lower level of diversification depending on legal and organisational forms. In all analysed groups of farms the prevailing majority of agricultural land belongs to farms with area above 100 ha. This share – with an average of 97% – ranged from 96% to 98% in foreign-owned, state-owned, domestic companies and SPR farms accounted for 86% in other domestic private and 69% in municipal (Table 4). So the diversified share of farms with larger areas (30-100 ha), medium areas (10-30 ha) and small share of small farms in the structure of agricultural land is only observed in the group of municipal farms (21%, 7% and 3% respectively) and other private farms (7%, 5% and 2% respectively).

Table 4

*Structure of agricultural land in farms of legal persons in total by area groups and basic legal and ownership forms of the farms in 2010 against the backdrop of farms of natural persons*

Farms	Total ha	Area groups in hectares of agricultural land in %							
		up to 1	1-5	5-10	10-20	20-30	30-50	50-100	≥100
Total	15502975	1.7	14.1	16.1	20.0	9.5	8.8	7.5	22.3
including: natural persons	13660413	1.9	16.0	18.3	22.6	10.8	9.9	8.3	12.2
Total legal persons	1842562	0.0	0.1	0.1	0.2	0.3	0.5	1.8	97.0
Public	566856	0.0	0.0	0.1	0.2	0.2	0.5	1.7	97.2
- state-owned	552697	0.0	0.0	0.0	0.1	0.1	0.4	1.3	98.0
- municipal <sup>a</sup>	14160	0.0	1.3	1.6	3.7	3.4	6.5	14.2	69.3
Private domestic	1275705	0.0	0.1	0.1	0.3	0.2	0.5	1.8	96.9
- SPR	248722	0.0	0.0	0.1	0.3	0.2	0.6	2.9	95.9
- domestic companies	782324	0.0	0.0	0.1	0.1	0.2	0.4	1.5	97.7
- other	61257	0.0	0.7	1.5	2.4	2.2	2.8	4.2	86.3
Foreign <sup>a</sup>	183403	0.0	0.0	0.0	0.1	0.1	0.4	0.9	98.5

<sup>a</sup> and mixed ownership.

Source: Own calculation and specification based on: as in Table 2.

### Farms with agricultural activity

When assessing changes in the number and structure of agricultural holdings, the changes related to farms with agricultural activity are of fundamental importance.

In the first period of system transformation (1990-1996), in connection with liquidation of the production sector of state-owned farms and an ostracism towards cooperative forms of farming, as well as substantial difficulties with rational management of assets (agricultural land in particular) of liquidated PGRs, the situation



in the sector of farms of legal persons in the area of effective use of agricultural land for agricultural activity was very unfavourable. First of all, a significant part of agricultural holdings remaining in the Agricultural Property Stock of the State Treasury ceased agricultural production, while part of newly established farms (primarily on the basis of post-PGR assets) did not launch production or limited it due to low profitability of production or financial difficulties. In the final years of this period the process of termination of lease contracts started (most often at the request of the Agency). Farms would return to the Agricultural Property Stock of the State Treasury typically with ceased production, and the sale of such farms or finding a new lessee quickly was difficult in a situation of decreasing profitability of agricultural production. At the beginning of the period under analysis, the situation in terms of effective use of agricultural land in this sector of farms was unfavourable. A large part of farms would not carry out agricultural activities, while farms which did, would withdraw from agricultural production on large areas of their land. First of all, a large part of arable land was set aside or kept fallowed, while grassland was not rationally used because of widespread withdrawal from rearing of grazing livestock (fed on grass). In 1996 as many as nearly 1/4 of farms of legal persons did not carry out agricultural activity (Table 5).

In the pre-accession period, the number of farms of legal persons carrying out agricultural activities significantly decreased (Tables 1 and 5), but to a lesser degree than the number of legal farms in total (21.2% and 27.4% respectively). As a result the share of farms carrying out agricultural activities in the total population of farms of legal persons slightly increased (from 70.9% to 76.9%)<sup>10</sup> – in 1996 the share of farms without agricultural activity in the sector of farms of legal persons was still clearly higher than in the sector of individual farms, but in 2002 it was slightly lower. This improvement would be even more clear, but for deterioration of the situation in this respect in the group of state-owned farms, where the share of farms without agricultural activity increased from 31.8% to 40.4%. Also in the group of domestic companies, typically organised on the basis of post-PGR assets leased from the Agricultural Property Stock of the State Treasury, there was a regression and the share of farms without agricultural activity increased from 7.9% to 14.6%. These data again confirm that such a high share of farms without agricultural activity in 1996 was primarily a result of substantial difficulties with effective use of assets of liquidated PGRs.

In the remaining groups of farms under analysis, the increase of the share of farms with agricultural activity in the total number of farms was recorded, but in the SPR group it took place together with a substantial decrease of the number of these farms, while in the remaining groups with a substantial increase of their number (Table 5).

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<sup>10</sup> In the sector of individual farms, the trend of changes in this respect was different, both in terms of direction and scale. In this sector the number of farms carrying out agricultural activity decreased by 18.2%, while the overall number of farms – by only 4.3%. The share of farms carrying out agricultural activity in this sector substantially decreased – from 87.5% to 74.2%.

Table 5

*Farms of legal persons carrying out agricultural activity and agricultural land in these farms in 2002 and 2010*

Farms	Number			% of total in the group		Agricultural land in thousand hab			% of total in the group	
	1996	2002	2010	1996	2002	2010	2002	2010	2002	2010
Total	2682350	2177591	1891065	87.5	74.2	83.0	15160.2	15026.2	89.7	96.9
including: natural persons	2677810	2174015	1886888	87.5	74.2	83.0	13517.7	13379.0	91.0	97.9
Total legal persons	4540	3576	4177	70.9	76.9	96.5	1642.5	1647.2	80.5	89.4
Public	1370	837	828	68.0	66.1	90.0	565.0	373.3	60.5	65.8
- state-owned	1332	557	595	68.2	59.6	87.6	550.2	359.2	60.0	65.0
- municipal <sup>a</sup>	38	280	233	58.7	84.6	96.7	14.8	14.1	88.1	99.9
Private domestic	3055	2550	3076	71.9	80.0	98.2	943.5	1090.6	97.4	99.8
- SPR	1633	1002	826	66.2	80.9	98.7	318.0	248.5	98.2	99.9
- domestic companies	1064	960	1714	92.1	85.4	98.0	609.6	781.1	97.8	99.8
- other	358	588	536	56.9	79.4	98.0	15.9	61.0	97.9	99.9
Foreign <sup>a</sup>	115	189	273	84.6	96.4	98.6	134.1	183.3	96.5	99.9

<sup>a</sup> and mixed ownership; b For 1996 there is no data on area of agricultural land in farms of legal persons carrying out agricultural activity and it cannot be calculated on the basis of available GUS publications.

Source: Own calculation and specification based on: as in Table 2.

In the post-accession period the share of farms carrying out agricultural activity substantially increased in the sector of farms of legal persons, similarly to the group of farms of natural persons (Table 5). This was the result of inclusion of Polish agriculture in EU CAP since 2004 (primarily introduction of area payments) and related change of definition of a farm carrying out agricultural activity<sup>11</sup>. In 2002-2010 the share in farms of legal persons increased from 76.9% to 96.5%, and in farms of natural persons from 74.2% to 83%. In farms of legal persons this was primarily the result of a more favourable area structure, and in particular substantially lower share of farms from smallest area groups (primarily those with up to 1 ha of agricultural land, not covered by area payments).

In 2010 there were 308.2 thousand farms not carrying out agricultural activity in the area group of up to 1 ha of agricultural land (43.1%), while in the sector of farms of legal persons there were 4.5% (5 farms). In the area group of 1 ha and more of agricultural land the differences were already small. In the sector of farms of natural persons – 5.0% (78.2 thousand farms), and in the sector of legal persons – 4.5% (147 farms).

<sup>11</sup> Presently agricultural activity includes not only carrying out agricultural production but also keeping agricultural land in good agricultural condition (in case of arable land - keeping it fallow, and in case of grassland – typically mowing it).

The share of farms carrying out agricultural activity in the total number of farms was and continues to be strongly diversified depending on legal and ownership form of these farms (Table 5). Despite substantial increase in the period under analysis, it was and continues to be the smallest in state-owned farms (59.6% in 2002 and 87.6% in 2010), and particularly in the State Treasury farms (50.3 and 84.5% respectively), that is on average in the largest farms in terms of area. This is connected with a still on-going process of distribution (privatisation in particular) of assets, including agricultural land, of liquidated state-owned agricultural holdings. In the remaining farms of legal persons this share was substantially higher and became very balanced in 2010 (from 98.0% in domestic companies to 98.7% in agricultural production cooperatives – SPRs). It should be emphasised that the share of legal farms carrying out agricultural activity in all these forms was higher than in the sector of farms of natural persons (Table 5).

The changes to the number and structure of farms with agricultural activity presented above led to the increase of the share of agricultural land used by these farms in the total area of agricultural land of this sector. Generally, the share of farms with agricultural activity increases with the increase of area of farms, the share of agricultural land is higher than farms with agricultural activity<sup>12</sup>. In the sector of farms of private legal persons, because the substantial majority of agricultural land is used by farms with very large areas, the share of agricultural land in use of farms with agricultural activity in the case of all analysed legal and organisational forms is nearing 100% (in domestic companies it amounts to 99.8% and in all remaining groups to 99.9%). In the group of state-owned farms (in principle in holdings of the State Treasury), farms with very large areas represent a substantial part of farms not carrying out agricultural activity. As a result, for these farms the situation is opposite – the share of farms with agricultural activity is higher than the share of agricultural land of these farms in the area of agricultural land of farms in total (in 2010 87.6% and 65.0% respectively).

### **Diversification of changes on the number of legal farms and the area of agricultural land used by them by voivodships in 1996-2010<sup>13</sup>**

After the period of intensive system transformation, that is in 1996, the regional diversification in the share of farms of natural persons and legal persons in the structure of all agricultural holdings was insignificantly lower than at the beginning of system transformations. Nationwide, the percentage of these farms amounted to 0.26%, while at the level of voivodships it ranged from slightly below 0.1% in Świętokrzyskie, Małopolskie and Podkarpackie, between 0.1-0.2%

<sup>12</sup> This is particularly clearly visible in the sector of farms of natural persons. The share of farms with agricultural activity in 2010 amounted to 83% and the share of agricultural land of these farms in the total area of agricultural land used by this sector was nearly 98%.

<sup>13</sup> For the pre-accession period, only diversification of changes in the area of agricultural land on farms of legal persons in total with the area of 1 ha of agricultural land and more shall be presented (due to difficulties in data acquisition).

in Mazowieckie, Lubelskie, Łódzkie, Podlaskie and Śląskie, to 1.4% in Zachodniopomorskie and ca. 1% in Lubuskie. It was also relatively high in Pomorskie, Opolskie, Warmińsko-mazurskie and Dolnośląskie - at ca. 0.7% each. In 1996-2002, in voivodships where it had been very low (Małopolskie, Świętokrzyskie, Podkarpackie, Mazowieckie, Łódzkie), it changed only slightly, but it substantially decreased in majority of voivodships with its very high level (Lubuskie, Zachodniopomorskie, Warmińsko-mazurskie, Opolskie). A rather small scale of decrease of this share in Wielkopolskie and Kujawsko-pomorskie deserves attention.

Due to the fact that – on average – farms of legal persons are much bigger in terms of area than farms of natural persons, diversification of their share in the structure of agricultural land used by all agricultural holdings is substantially more important. The share of these farms, after the period of intense system transformations, was highest in the so-called post-PGR voivodships, where distribution of post-PGR land was taking place with significant difficulties (Lubuskie 41.6%, Zachodniopomorskie nearly 40%) or where very large and efficient PGRs existed, which were difficult to privatise (Opolskie 34.7%), and lowest in voivodships with very few PGRs (Łódzkie 2.8%, Mazowieckie 3.3%, Małopolskie 4%, Świętokrzyskie 5.4%).

In 1996-2002 the share of farms of legal persons in the use of agricultural land decreased in all voivodships, therefore the regional diversification was not subject to any major changes.

On the other hand, in 2002-2010 the changes in this area went in different directions. In six voivodships this share slightly increased, including four where it had been high, though not the highest (Dolnośląskie, Kujawsko-pomorskie, Pomorskie, Wielkopolskie and Zachodniopomorskie), and in two voivodships, where it had been low (Łódzkie and Mazowieckie). In remaining voivodships this share decreased, while the decrease was substantial in voivodships with a low level already and a high dynamics of this process from the beginning of the transformation (in Podlaskie from 6.2% in 1996 to 3.3% in 2002 and 1.8% in 2010 and in Świętokrzyskie by 5.4%, 3.3% and 1.8% respectively). As a result the regional diversification increased, but at a slightly lower level. The largest share of farms of legal persons in the use of UAA in 2010 was characterised to: Zachodniopomorskie – 33.8%, Opolskie – 28%, Lubuskie – 24.7%, Pomorskie – 22.1% and Dolnośląskie – 21.9%, while the lowest: Świętokrzyskie – 1.3%, Podlaskie – 1.8% and Łódzkie – 2.1%.

A substantial majority of farms of legal persons, and particularly of agricultural land used by them, was located in six western and northern voivodships<sup>14</sup> (where the state-owned agricultural holdings had dominated at the beginning of system transformations). Also the voivodships with a high level of agricultural practice, i.e. Kujawsko-pomorskie and Wielkopolskie had a significant share in this structure (Table 6).

<sup>14</sup> After recalculation according to the administrative division in place since 1998: Zachodniopomorskie, Pomorskie, Warmińsko-mazurskie, Lubuskie, Dolnośląskie, Opolskie.

Table 6

*Changes in the share of farms of legal persons<sup>a</sup> and agricultural land used by them in the structure of all farms and total agricultural land in 1996-2010 by voivodships (in %)*

Voivodships	In structure of farms			In structure of agricultural land		
	1996	2002	2010	1996	2002	2010
Dolnośląskie	0.69	0.61	0.85	25.7	21.3	21.9
Kujawsko-pomorskie	0.43	0.38	0.47	15.5	10.5	12.8
Lubelskie	0.12	0.09	0.09	7.0	4.6	3.0
Lubuskie	0.97	0.75	1.02	41.6	32.9	24.7
Łódzkie	0.15	0.12	0.13	2.8	1.7	2.1
Małopolskie	0.09	0.10	0.10	4.0	3.2	3.1
Mazowieckie	0.11	0.11	0.13	3.3	2.7	3.2
Opolskie	0.72	0.57	0.81	34.7	28.5	28.0
Podkarpackie	0.09	0.09	0.12	7.6	8.9	7.8
Podlaskie	0.16	0.11	0.10	6.2	3.3	1.8
Pomorskie	0.79	0.54	0.56	25.0	19.5	22.1
Śląskie	0.19	0.15	0.18	12.1	9.9	6.3
Świętokrzyskie	0.08	0.09	0.06	5.4	2.1	1.3
Warmińsko-mazurskie	0.70	0.46	0.54	26.6	20.7	17.3
Wielkopolskie	0.49	0.47	0.49	21.2	16.1	16.4
Zachodniopomorskie	1.39	0.99	1.47	39.9	33.0	33.8
POLAND	0.26	0.22	0.27	15.6	12.1	11.9

<sup>a</sup> The number of farms of legal persons does not include farms with up to 1 ha of agricultural land due to their small number and negligible share in their structure (in 1996 – 0.1%, in 2002 – 0.02% and in 2010 – less than 0.01%).

Source: As in Tables 1 and 2.

In 2002-2010, with a decrease in the number of farms of legal persons in total nationwide by 7%, and a decrease of agricultural land in these farms by 10%, the situation in individual voivodships very much differed. An increase in the number of farms under analysis was recorded in four voivodships, which thus far had been characterised by a large share of this form of farming (Zachodniopomorskie, Lubuskie, Dolnośląskie and Kujawsko-pomorskie), but also in Podkarpackie. An increase of the area of agricultural land in this sector took place in three voivodships with a substantial share of this form of farming (Kujawsko-pomorskie, Pomorskie and Dolnośląskie) and in Łódzkie. The number of farms under analysis decreased in 11 voivodships, and the area of agricultural land of these farms decreased in 12 voivodships. Shrinking of this sector of farms, expressed primarily through reduction of the area of agricultural land, to a largest extent affected the group of voivodships with a substantial domination of indi-

vidual farms, typically with a fragmented agrarian structure (Śląskie, Lubelskie, Świętokrzyskie), but also those with a relatively favourable agrarian structure and at the same time the large share of modernised and restructured farms (Podlaskie). As to the farms with agricultural activity, an increase of their number took place in as many as 12 voivodships and a decrease in only 3 voivodships (Świętokrzyskie, Śląskie and Łódzkie). The highest level of increase was obviously recorded in voivodships, where the percentage of farms not carrying out production in the total number of farms was the highest in 2002.

Table 7

*Farms of legal persons carrying out agricultural activity and agricultural land used by these farms by voivodships<sup>a</sup> in 2002 and 2010*

Voivodships	Number of farms		2010/ 2002	In % of total <sup>b</sup>		Area of agricultural land		2010/ 2002	In % of total <sup>c</sup>	
	2002	2010		2002	2010	2002	2010		2002	2010
Poland	3576	4177	116.8	76.9	96.5	1642.6	1647.3	100.3	80.5	89.4
Dolnośląskie	432	539	124.8	81.2	97.5	203.3	197.2	97.0	92.0	88.7
Kujawsko-pomorskie	258	297	115.1	85.7	96.9	106.7	132.0	123.7	91.8	99.8
Lubelskie	173	187	108.1	81.2	98.9	36.7	41.6	113.4	50.2	99.5
Lubuskie	196	250	127.6	81.7	97.6	122.4	112.3	91.7	77.4	99.5
Łódzkie	179	162	90.5	84.0	95.9	18.4	21.6	117.4	93.4	98.2
Małopolskie	145	163	112.4	65.9	93.3	22.2	19.3	86.9	89.2	99.5
Mazowieckie	253	263	104.0	65.9	93.2	38.3	27.8	72.6	63.4	54.0
Opolskie	239	239	100.0	92.3	98.3	156.9	146.3	93.2	98.4	99.9
Podkarpackie	115	172	149.6	67.3	98.9	28.4	33.5	118.0	39.5	62.0
Podlaskie	79	92	116.5	73.8	92.3	34.6	18.2	52.6	91.8	98.4
Pomorskie	212	252	118.9	68.4	96.0	158.4	139.7	88.2	93.4	76.0
Śląskie	152	137	90.1	75.2	94.0	52.0	27.2	52.3	97.0	98.2
Świętokrzyskie	79	56	70.9	73.8	88.5	11.6	7.1	61.2	87.2	89.9
Warmińsko-mazurskie	180	282	156.7	65.2	97.6	153.8	147.1	95.6	65.8	77.1
Wielkopolskie	591	610	103.2	84.8	98.6	284.1	276.4	97.3	96.9	99.1
Zachodniopomorskie	293	476	162.5	70.1	95.0	214.7	300.0	139.7	64.1	90.2

<sup>a</sup> According to the seat of a user; <sup>b</sup> % in relation to the total of farms of legal persons in a given voivodship; <sup>c</sup> % in relation to the total UAA of farms of legal persons in a given voivodship.

Source: As in Tables 1 and 2.

As a result of changes presented above, the regional diversification of the share of farms of legal persons in individual voivodships substantially deepened. The share of 6 so-called post-PGR voivodships and 2 voivodships with the high level of agricultural practice in the total number of farms of legal persons increased from 56.3% to 68.9% and in agricultural land from 82.5% to 86.9%.



On the other hand it decreases respectively in remaining voivodships, which at the beginning of the period under analysis were characterised by domination of farms of natural persons.

The regional diversification was even higher in case of farms of legal persons carrying out agricultural activity. The share of this farms in the total number was the highest in voivodships characterised by high level of agricultural practice (Opolskie, Kujawsko-pomorskie and Wielkopolskie) and above national average in the so-called post-PGR voivodships (with the exception of Warmińsko-mazurskie and Zachodniopomorskie), and relatively low in voivodships dominated by small individual farms with the lowest number of farms of legal persons.

### **Primary directions of changes in agricultural production**

As pointed out above, the prospect of inclusion of Polish agriculture in the EU Common Agricultural Policy starting with 2004 was the basic driver stimulating interest of farms in agricultural activity. In the pre-accession period there was a slight, and in the post-accession period a substantial increase of the share of farms with agricultural activity. In the pre-accession period the reason for a small increase of interest of farms in development of agricultural production was low profitability of agricultural production. The area under crops was decreasing faster than the area of utilised arable land. In 1996-2002 the percentage of arable land sown decreased from 75.3% to 70.4%. At the same time in this period the process of farms giving up or substantially reducing animal production was under way. The share of farms keeping basic livestock decreased from 42% to 34%, including cattle from 23.4% to 18.3% (cows from 20.7% to 16.6%) and pigs from 31.5% to 23.5%. The number of animals also decreased substantially. As a result the share of farms of legal persons in the national animal headage decreased strongly in case of pigs (from 14.1% to 7.5%), substantially in cattle rearing (from 7.6 to 5.5%) and to a slightly lesser degree in cow rearing (from 5.5 to 4.7%). The indicated decrease of both plant and animal production resulted primarily from complete discontinuation of agricultural production in most of State Treasury holdings designated for privatisation and substantial reduction of animal productions in remaining state-owned farms. In the group of state-owned farms the headage of cattle decreased by 58%, cows by 48% and pigs by as much as 74%.

In the post-accession period, in connection with introduction of subsidies and improvement of conditions for farming, the interest in agricultural production, especially on the part of larger and highly commercial farms, substantially increased (more on this subject: Dzun W., Dzun P. 2013). The number of farms with crops increased from 3159 to 3459, i.e. by 10% which was accompanied by the increase of the number of farms with agricultural activity by 16.8%. At the same time there was an increase of area under crops on farms of legal persons by 14.8 (from 1113.7 thousand ha to 1278.3 thousand ha), accompanied by an increase of the area of agricultural land in farms carrying out agricultural activ-



ity by 0.3%<sup>15</sup>. As a result farms of legal persons are characterised by high level of use of agricultural land for crops. With the average at 96.6%, the highest share of arable land under crops had SPRs (98.8%) and the lowest – farms of other private domestic legal persons (apart from SPRs and domestic companies) – 74.6%, followed by farms owned by the State Treasury (83.3%).

Also the post-accession period saw substantial changes in livestock rearing. Although the number of farms keeping livestock decreased (by 14.3%)<sup>16</sup> and their share in the structure of total farms of this sector decreased as well (from 37.1% to 34.1%), at the same time there was a strong increase of headage of all livestock with the exception of sheep (pigs and poultry by over 1/2, cattle and cows by more than 1/10)<sup>17</sup>. The largest decrease was recorded in the number of farms keeping pigs and chicken, very slight in those keeping cattle, including cows, with the accompanying highest increase in the headage both of pigs and poultry (more than 54% each), quite high increase of cattle (by 12%) and slightly smaller of cows (by 10%).

The analysis above indicates that over the entire period under analysis, and in particular in the post-accession period, a dynamic process of simplification, specialisation and concentration of both plant and animal production was visible. It was clearly reflected in the changes in structure of farms according to agricultural types.

In 2002-2010 the number of farms of legal persons for which an agricultural type was defined according to the methodology from the year 2002 increased from 3368 to 3627, that is by 7.7%. While in 2002 agricultural type was defined for 94.2% farms with agricultural activity, in 2010 it was defined for 86.8%. The reason for lower share (though the increased number) could be the fact that in 2010 the group of farms with agricultural activity also included farms, whose activity was limited to keeping agricultural land in good condition.

When analysing farms of legal persons according to agricultural types, it should be first of all pointed out that most of farms specialise in field crops (Table 8). In 2002-2010 the number of such farms increased from 1566 to 2130, i.e. by 36%, and their share from 46.5% to 58.7% (the highest level of increase pertained to farms with 100 ha and more).

Agricultural types with mixed specialisation also have a substantial share in the population in question. However, the period under analysis saw a significant

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<sup>15</sup> In the case of farms of natural persons the number of farms with crop production decreased by as much as 27.3%, with the decrease of the number of farms with agricultural production by 13.2%. The share of farms with crops in the total number of farms carrying out agricultural activity decreased by 15 pp (from 92.2% to 77.2%). The area under crops decreased by 5.5%, with the decrease of the area of agricultural land of farms carrying out agricultural activity by 1%.

<sup>16</sup> These data cannot be compared to the data of the previous period, as the changes in 1996-2002 affected only basic livestock.

<sup>17</sup> In the case of farms of natural persons the decrease of the number of farms keeping livestock and their share in the structure of total farms was much larger – by 27.1% and from 63.3% to 46.6% respectively.

decrease of the number of farms of these types, i.e. with: various crops (by 45%), various animals (by 41%) and with various crops and animals together (by 25%). Their total share in the structure of all farms under study substantially decreased (from 31.6% to 20.7%, i.e. by 10.9 pp). However, the steady large share of farms of the type “various crops and animals together” in the group of farms very large in terms of area is understandable, because due to their size these farms may develop several directions of production on a scale ensuring satisfactory efficiency.

Table 8

*The structure of legal farms of defined agricultural types according to area groups in 2002-2010 and in % of total farms in a given area group (vertical structure)*

Specification	Years	Total number types (%)	Area groups of agricultural land (ha)							
			up to 1	1-5	5-10	10-20	20-30	30-50	50-100	100 and more
Total number of farms/specialisations (agricultural types)	2002	3368	102	330	213	195	122	165	297	2010
	2010	3627	116	244	209	219	128	188	340	2183
Field crops	2002	46.5	6.9	48.8	55.9	52.8	62.7	50.0	51.6	44.7
	2010	58.7	5.2	53.7	67.5	68.9	68.8	59.6	62.1	59.1
Horticultural cultivations	2002	2.8	22.5	10.0	5.6	4.1	2.6	1.3	1.8	0.4
	2010	2.7	13.8	15.2	3.8	5.0	3.9	2.1	1.5	0.5
Permanent crops	2002	7.7	4.9	12.4	7.5	8.2	10.4	11.3	12.8	6.0
	2010	4.9	3.4	9.0	6.2	4.6	7.0	14.4	10.9	2.6
Rearing of livestock fed in the grazing system	2002	4.2	7.8	3.0	2.8	3.6	1.7	5.3	6.0	4.3
	2010	7.0	16.4	5.3	5.7	5.5	4.7	6.9	5.6	7.3
Rearing of livestock fed with concentrated feeds	2002	7.1	45.1	8.2	5.2	10.3	6.1	11.3	8.5	4.4
	2010	6.1	54.3	7.0	2.9	3.2	3.1	6.4	4.7	4.4
Various crops	2002	5.4	4.9	9.1	10.8	9.7	7.0	6.0	4.3	3.8
	2010	3.3	1.7	7.0	3.8	4.1	4.7	1.6	4.1	2.7
Various animals	2002	6.2	0.0	2.7	4.2	5.6	0.9	6.0	3.9	8.1
	2010	3.4	2.6	0.8	3.3	4.1	1.6	2.1	2.4	4.1
Various crops and animals together	2002	20.0	7.8	5.8	8.0	5.6	9.6	8.7	11.0	28.5
	2010	14.0	2.6	2.0	6.7	4.6	6.3	6.9	8.8	19.4

Source: Own calculations made on the basis of the study entitled “Gospodarstwa rolne – grupy obszarowe a kierunki produkcji”, PSR 2002, GUS Warsaw 2005 and unpublished GUS data.

As to the remaining production types, the attention should first of all be drawn to increasing number and share of farms specialising in rearing of animals fed in the grazing system (the increase in their number from 143 to 253, i.e. by as much as nearly 80%, and the share from 4.2 to 5.2%) and the decreasing number and share of farms specialising in permanent crops (the number from 261 to 178 and the share from 7.7% to 4.9%) and in keeping of animals fed with concentrated feeds (the number from 240 to 220 and the share from 7.1 to 6.1%). The percentage of farms specialising in horticultural cultivations in the sector of farms of legal persons was small and even decreased slightly (from 2.8 to 2.7%) with a small increase in the

number of such farms. When considering the farms specialising in grazing live-stock, it is interesting that the largest increase of the number and share of farms of this type took place on small-sized farms including primarily in the group up to 1 ha. This could result from separation of grazing animals farms – as independent farms – from large-sized farms, as well as from smaller farms, involved in for example agro-tourism or keeping of various grazing animals, e.g. goats, transforming into this type of farms (which could be connected with higher subsidies for grassland in the case of keeping livestock). One should also point to a large increase of the number and share of farms specialising in keeping animals fed with concentrated feeds in the smallest area groups. It is a result of development of poultry keeping and, though to a lesser degree, keeping of pigs of semi-industrial type.

### **Changes in labour inputs**

The basic feature of changes in labour and capital input on farms of legal persons was flexible adaptation of their level and structure to changes in resources of agricultural land used for agricultural activity and to the changing level and direction of agricultural production.

In the pre-accession period labour resources decreased at a pace much faster than the area of agricultural land used, because – as indicated above – the level of their use for agricultural production decreased. This pertained primarily to farms of the public sector. In this sector the number of workers calculated in AWU equivalent decreased from ca. 68.5 thousand to 21.1 thousand, i.e. by nearly 70%. The number of workers per 100 ha of agricultural land employed in this sector decreased from 5.5. to 3.7 persons. The dynamics of the decrease of the number of persons working in state-owned farms was even slightly higher, as the number of persons working in farms owned by self-governments and with mixed ownership significantly increased (from several dozen persons<sup>18</sup> to 1.4 thousand persons). This was a result of the progressing distribution of the State Treasury Agricultural Property Stock, privatisation of State Treasury companies, also those specialised in breeding of plants and animals, as well as reduction or complete discontinuation of agricultural production in non-distributed agricultural holdings of the State Treasury Agricultural Property Stock.

The number of workers in SPRs also decreased rapidly. It could be pointed out that the number of working members of these cooperatives decreased in annual average perspective from 41.6 to 21.8 thousand, that is by nearly 48% with reduction of the area of agricultural land by more than 35%. On one hand this was the result of liquidation of economically weak cooperatives, typically characterised by excessive employment, on the other – of restructuring and modernisation of cooperatives remaining in a difficult agricultural market, normally

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<sup>18</sup> In 1996 these farms used ca. 7 thousand hectares of agricultural land. Assuming that in these farms the number of persons working per 100 ha of agricultural land would be even twice as high as in state-owned farms, the number of persons working on these farms in AWU would be lower than 0.1 thousand.

also through reduction of labour inputs. But there is no data on the number of working members of cooperatives involved in agricultural activity<sup>19</sup>. However, data from NAC 2002 indicate that there were nearly 4.5 thousand hired workers working in SPRs, calculated in AWU equivalent. However, it is also difficult to assess changes in this respect – firstly because absence of data on the number of persons working in agricultural production, secondly, because absence of comparable data from NAC 1996. On the basis of data from NAC as well as the results of IERiGŻ studies, it could be estimated that the number of persons working in SPR in 1996 calculated in AWU amounted to ca. 32-33 thousand and to ca. 16 thousand in 2002, so it decreased by more than 1/2.

The number of persons working on other private farms of legal persons (other than cooperative farms) also decreased from 45 thousand to 28 thousand (including to ca. 22.4 in domestic companies, 0.6 in others and 5 thousand in the case of foreign and mixed). The number of workers per 100 ha of agricultural land in all these farms was at the level of ca. 3.7 AWU.

In total, in the entire sector of farms of legal persons, the number of persons working in agricultural production decreased from ca. 146 thousand to 65 thousand persons (by 56%) and per 100 ha of agricultural land from 5.4 to ca. 4 full-time employed persons (AWU). In farms of natural persons employment per 100 ha of agricultural land decreased slightly – to 16.7 AWU in 2002. Such a situation was influenced by establishment and strengthening of the large-sized farms' subsector within the sector of natural persons, which was established mainly on the basis of assets of liquidated state-owned farms (PGRs), where the level of employment was similar to that in farms of legal persons.

In 2002-2010 the number of persons working on farms of legal persons decreased by ca. 1/4 (Table 9), with only slight reduction of the area of agricultural land in farms carrying out agricultural activity (by ca. 1%) and a substantial increase of the number of livestock kept on these farms (by several percent – Table 9). As a consequence, the number of workers in this sector – taking into account all agricultural land – decreased from 4.0 to 3.0 AWU per 100 ha, and taking into account only agricultural land kept in good agricultural condition – to 3.2 AWU per 100 ha. In the sector of natural persons there was also a slight decrease of the number of workforce (respectively from 16.7 AWU to 15.7 AWU per 100 ha of agricultural land in good agricultural condition), but it continues to remain at a very high level, despite substantially lower involvement of farms of this sector in animal production.

The labour input indicator (labour input calculated in AWU per 100 ha of agricultural land) and the changes of this indicator in the discussed period in the sector under analysis were strongly diversified depending on legal and ownership forms

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<sup>19</sup> There were no data collected in NAC 1996 and NAC 2002 on the number of SPR members working in agricultural holdings and their labour contribution to these farms.

of farms. In 2002 this indicator was highest in self-government farms (9.55 AWU per 100 ha) and the lowest in state treasury farms (2.14 AWU per 100 ha). It was relatively high in other state-owned farms (other than state treasury) and cooperative farms – 6.5 AWU per 100 ha and 5.0 AWU per 100 ha respectively. In the case of the other legal and ownership forms, it was at the level of 3.7-3.8 AWU per 100 ha. In 2002-2010, in the case of all legal and ownership forms, except for the state treasury farms (an increase from 2.1 AWU per 100 ha to 2.5 AWU per 100 ha) there was a decrease of the indicator under analysis. The largest decrease took place in other domestic private farms (other than agricultural production co-operatives and companies) and in other state-owned and self-government farms. As a result – without taking into account the rapid decrease of the value of this indicator in other private farms – the value of this indicator became more or less equal in the particular legal and ownership forms. The sharp decrease of this indicator in other private farms calls for a separate analysis. This was primarily the result of a large increase of the area of agricultural land on these farms, with a small increase of the sown area (the share of permanent grassland in the structure of agricultural land amounted to around 70% in 2010)<sup>20</sup> and a very small share of farms keeping livestock (in 2010 8.6% farms with cattle and 8.8% – with pigs compared with 20.7% and 33.2% respectively in SPRs).

Table 9

*Persons working on farms of legal persons by legal and ownership forms calculated as full-time employees (AWU) in 2002 and 2010*

Farms	Workers in AWU <sup>a</sup>		Dynamics of changes 2010/2002	AWU/100 ha of agricultural land	
	2002	2010		2002	2010
Total	65052	48796	75.0	3.96	2.96
Public	21061	11966	56.8	3.73	3.21
- state-owned	19648	11117	56.6	3.57	2.98
- self-government	1413	849	60.1	9.55	6.02
Private	43991	36830	83.7	4.03	2.89
- SPR	16000	11099	69.4	5.03	4.47
- domestic companies	22365	20302	90.8	3.67	2.60
- other domestic	582	570	97.9	3.66	0.93
- foreign <sup>b</sup>	5044	4859	96.3	3.76	2.65

<sup>a</sup> After estimation of the number of working members of agricultural production cooperatives; <sup>b</sup> and mixed ownership.

Source: (Dzun W., Dzun P. 2013) and Pracujący w gospodarstwach rolnych, PSR 2010, GUS, Warsaw 2012.

<sup>20</sup> This could be a result of transformation of arable land into grassland in order to obtain area payments and to lower the cost of keeping them in good agricultural practice (in principle only one mowing).

### Changed in the economic size of legal farms

The changes in the area structure and in the level and structure of production of analysed farms presented above, as well as in the profitability of agricultural production, were reflected in changes of their structure in terms of economic size.

In the period under study, the share of economically small farms (up to 8 ESU) in the structure of all farms of legal persons decreased slightly, the share of economically medium-sized farms (8-40 ESU) remained at the same level, while the share of economically large farms increased substantially (but the share of the economically largest farms above 250 ESU slightly decreased). However, there were still many economically small farms in the structure of farms of legal persons. In 2010 they represented as much as 27.8% (in 2002 30.7%). It is hard to explain it with the area structure, as in 2010 there were only 17.3% of small farms in terms of their area (up to 10 ha). The share of economically very large farms was also very small in this structure, as in 2010 it amounted to only 38.6% (in 2002 37.9%), while there were 55.8% of farms with the area of 100 ha and more.

The analysed structure of farms of legal persons was strongly diversified depending on their legal and ownership forms. At the beginning of the analysed period the most favourable structure had the other state-owned farms (other than state treasury), among which as many as 81.2% were economically large farms, including 73.8% with a size of 100 or more ESU, while only 7.4% were economically small farms. Domestic companies were characterised by only a slightly worse structure (economically large 79.7%, including 62.7% of the size of 100 or more ESU and 8.5% economically small), similarly to foreign and mixed ownership farms (respectively 75.0%, including 52.8% and 12.2%). Agricultural production cooperatives (SPRs) were characterised by a little less favourable structure.

In the period under analysis in all legal and ownership forms a slight deterioration of the economic structure of farms was observed. This concerned SPRs least. An opinion could be formulated that a certain equalization occurred as regards the analysed structures in these groups of farms. Self-government and state treasury farms were characterised by a substantially less favourable economic structure. In this period the structure of state treasury farms slightly improved (the share of economically small farms decreased from 56.2% to 48.5%, while the share of economically large farms increased from 26.8% to 30.5%), while the structure of self-government farms deteriorated (an increase of the share of economically small farms from 48.0% to 58.3% and a decrease of economically large farms from 15.9% to 15.0%). However, when comparing these structures it should be noted that state treasury farms had a much more favourable area structure than the self-governmental ones (the share of farms with the area of 100 ha or more respectively 54.7% and 14.6% and the share of small area farms – 8.6% and 41.1% respectively).

Other domestic farms (other than companies and SPRs) were characterised by definitely most unfavourable economic structure in 2002 – as many as 86.9% of economically small farms and only 2.6% economically large farms. To a cer-



tain extent the situation was a derivative of unfavourable area structure of this group of farms (46.7% small-sized and 42.6% medium-sized farms). There was no improvement of this unfavourable structure in this group in the period under research (the share of economically small farms increased slightly to 88% and the share of economically large farms increased to 3.3% at the same time).

Table 10

*Changes in the structure of farms by groups of economic size and legal and ownership forms in 2002 and 2010*

Farms	Farm size in ESU in 2002					Farm size in ESU in 2010				
	up to 8	8-16	16-40	40-100	100 and more	up to 8	8-16	16-40	40-100	100 and more
Total	89.8	6.8	2.8	0.4	0.2	87.4	7.1	4.3	0.9	0.3
including: natural persons	89.9	6.8	2.8	0.4	0.1	87.6	7.1	4.3	0.9	0.2
Total legal persons	30.7	6.3	10.5	14.5	37.9	27.8	6.4	10.5	16.7	38.6
Public	44.3	8.8	13.7	8.9	24.3	43.5	8.4	12.2	10.3	25.6
- state-owned	42.4	4.8	10.6	8.0	34.2	36.0	6.5	10.9	10.9	35.7
including: state treasury	56.2	5.8	11.1	8.2	18.6	48.5	8.1	12.9	10.3	20.2
- other	7.4	2.0	9.4	7.4	73.8	9.9	3.1	6.9	12.2	67.9
- self-governmental	48.0	16.6	19.6	10.7	5.2	58.3	12.1	14.6	9.2	5.8
Private legal	26.5	5.6	9.5	16.3	42.2	24.6	6.0	10.1	18.0	41.3
- SPR	15.9	6.7	14.2	22.2	41.0	15.7	6.8	14.7	21.4	41.3
- domestic companies	8.5	4.4	7.4	17.0	62.7	12.0	6.1	9.8	21.3	50.8
- other domestic	86.9	6.1	4.3	1.2	1.4	88.0	5.0	3.7	2.2	1.1
- foreign	12.2	3.9	8.9	22.2	52.8	13.7	4.8	9.6	15.7	56.2

Source: (Dzun W., Dzun P. 2013).

## Summary

In the period under analysis, the farms of legal persons, after rapid and deep changes in the ownership, legal and organisational structures in the first half of 1990s, continued to be the subject of a deep restructuring process. However, outcomes of these changes were dramatically different in the pre- and post-accession periods. The pre-accession period was characterised by a very large decrease of the total number of farms and only slightly lower decrease of the number of farms with agricultural activity, and as a result a slight increase of the share of the latter in the structure of all farms (from 71% to 77%). The share of farms with agricultural activity in the total area of agricultural land of this sector increased slightly more, to 80.5%, however it continued to be lower than in the sector of farms of natural persons, where it amounted to 91%. At the same time in this period the area under crops was decreasing faster than the area of uti-



lised arable land (the share of arable land under crops decreased from 75.3% to 70.4%). The process of farms giving up or substantially reducing animal production was also in progress. The share of farms keeping basic livestock decreased from 42% to 34%. The headage of livestock also decreased substantially.

In the post-accession period, with a slight decrease in the total number of farms, there was a substantial increase of the number of farms with agricultural activity. As a result the share of farms with agricultural activity in the structure of all farms increased to 97% and was substantially higher than in the sector of farms of natural persons, where it decreased to 83%. However, the percentage of agricultural land used by farms with agricultural activity in total agricultural land in 2010 continued to be lower than in the sector of farms of natural persons (97.8% and 89.4% respectively). Also in this period the area under crops increased by 14.8% with an increase of the area of arable land by ca. 0.3%. As a result, the farms of legal persons in 2010 were characterised by a very high share of arable land under crops (nearly 97%). In the same period the positive changes were also recorded in animal production. Although the number of farms keeping livestock decreased and their share in the structure of total farms of this sector decreased as well at the same time there was a strong increase in the number of livestock with the exception of sheep.

Over the entire period under analysis, and in particular in the post-accession period, a dynamic process of simplification, specialisation and concentration of both plant and animal production was visible. It was clearly reflected in the changes in structure of farms according to agricultural types. The share of farms specialising in field crops, which had been large, substantially increased even further.

Reduction of the area of agricultural land, decreased intensity of agricultural production (in particular through discontinuation of labour intensive production) and a substantial progress in simplification, specialisation and concentration of production, as well as more and more widespread use of services for various kinds of farm work not only in plant, but also in animal production, resulted in a very large decrease of the number of workers.

The changes presented above very much varied depending on the organisational and legal form of farms. As to the changes in the number of farms and the area of agricultural land used by them, both in the pre- and post-accession periods, a very large decrease concerned the group of state-owned and cooperative farms, and a very large increase was observed in the group with foreign or mixed ownership. In the remaining groups of farms changes were even more diversified. In total, over the entire period under analysis, the area of agricultural land increased in other domestic private farms (other than SPRs and companies) and self-government ones, and it slightly decreased in the case of domestic companies. In the structure of all analysed groups of farms, apart from the group of state-owned farms, there was a substantial increase in both the share of farms with agricultural activity and the area of agricultural land used by them. However, the outcomes of restructuring of the group of state-owned farms are

negatively affected by still unfinished process of effective distribution of the Agricultural Property Stock of the State Treasury.

The analysis of changes indicates that the sector of legal farms, after a substantial regression and the fundamental changes to its legal and organisational structure in 1990-1996 as well as the significant decrease in the pre-accession period, has been clearly entering the path of growth over the recent years.

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