

Paweł CHMIELIŃSKI* and Bożena KARWAT-WOŹNIAK*

Changes in population and labour force in family farming in Poland

This paper discusses changes in population and labour in family farming in Poland. We analyse the size and socio-demographic characteristics of the farming population, the degree of utilisation of own labour resources on the farm and the assessment of labour inputs in family farming. Our research uses data from IERiGŻ-PIB field studies as well as general statistics. In comparison to the European Union as a whole, the socio-demographic (education and age) structure of the farming population in Poland is relatively favourable. There has been a significant reduction in the share of persons working exclusively on the family farm while the share of those with off-farm employment has increased. Around 500,000 persons who are not registered as unemployed and may be considered as redundant from the point of view of farming activities and represent hidden unemployment. We conclude that employment on family farms has a decreasing role in reducing the imbalance in the rural labour market in Poland.

Keywords: agriculture, farm structure, off-farm employment

* Instytut Ekonomiki Rolnictwa i Gospodarki Żywnościowej - Państwowy Instytut Badawczy, Świętokrzyska 20, 00-002 Warszawa, Poland. Corresponding author: chmielinski@ierigz.waw.pl

Introduction

Economic development can result in a reduction in the economic significance of agriculture, in terms of a decreasing share in Gross Domestic Product (GDP). Such a trend is increasingly visible in the Polish economy, despite the increase in agricultural production (Mrówczyńska-Kamińska, 2008). As a result, in 2013 the agricultural sector accounted for just 3.4 per cent of Poland's GDP (GUS, 2014). Nonetheless, this figure is still almost double the average figure for the European Union (EU) which was 1.8 per cent in 2012 (Nurzyńska, 2014). The continuing impact of the agricultural sector on the general economic and social situation in Poland is illustrated by its relatively large significance in the employment structure of the rural population (Chmieliński, 2013) and the livelihood strategies of rural households (Sikorska, 2006; Karwat-Woźniak, 2012).

Currently the biggest challenge in the economic sphere is the competitiveness of the agri-food sector, which must make more efficient use of its production potential (especially land and labour resources). Labour productivity is low and the excessive number of workers engaged in agriculture is an important factor hindering economic change in the sector. Implementing the desirable structural changes mostly involves the activation of concentration processes in the agrarian structure, the reduction in the number of persons employed in agricultural production and the improvement of labour productivity (Cramer *et al.*, 2001). The activation of such processes has been hampered not only by macroeconomic conditions, particularly labour market imbalance, but also by the socio-demographic characteristics of the farming population. Therefore, the problem of off-farm employment in rural areas has become increasingly important, particularly for farming families (Gardner and Rausser, 2001). There is a need to diversify the economic activities of the farming population in order to improve the competitiveness of agriculture, increase income levels and implement the multifunctional development of agriculture and rural areas (this entails the provision of both commodity and non-commodity goods and services by farms to society, such as landscape, employment, rural viability etc. as well as creation of strong rural non-farm economy).

In farming, replacement of land with capital is becoming more significant (Johnson, 2002) and, as a consequence, the impact and significance of the area of cultivated land in determining the production results of farms are decreasing (Woś, 1998). To a relatively larger extent, land is becoming the environment and space of agricultural production rather than a production factor (Woś, 2001). However, under the conditions of Polish agriculture, especially from the perspective of particular agricultural manufacturers, the area of land used still, to a great extent, determines both the scale of production and the profitability of agricultural activities (Zegar, 2009a). This means that under conditions of high fragmentation in terms of area, an increase in the farm's area may considerably affect the economic situation¹. Achieving a reasonable level of concentration of agricultural land is also desired from the point of view of the protection of natural resources and sustainable agricultural development (Wrzaszcz and Zegar, 2014). In this case, the development of the agricultural sector in Poland is strongly linked to processes of land concentration, especially within individual² (family) farms (Zegar, 2009b).

Concentration processes in agriculture also determine the increasing requirements of the recipients of agricultural products, especially regarding the size of product batches. The necessity for farmers who aim to at least maintain their level of income from agriculture to increase their scale of production is also more and more evident. This requirement should also be related to trends of relative decrease in prices of agricultural products³ which, as a matter of principle, is a universal regularity and results in the decrease in profitability of agricultural production.

Since modern production technologies are inherently

¹ A study by Karwat-Woźniak (2009) proved that in Polish conditions, an increase in the area of cultivated land by 1 ha increases the farm's opportunity to move to a higher production group by 3-4 per cent.

² Despite certain conceptual differences, we use terms: family farms and individual farms interchangeably.

³ In 2012, as compared to 1995, the index of prices of products purchased by farmers amounted to 317.4 per cent, while a similar index regarding products sold by farmers amounted to only 240.6 per cent. As a result, the index of prices (price scissors) of products sold by farmers to products purchased for the purposes of agricultural production at that time amounted to 73.4 per cent, (75.7 per cent - when it comes to products purchased for production purposes) which means that the prices of products sold by farmers were increasing 25 per cent slower than the prices of products purchased by them (GUS, 2013).

Table 1: Changes in land structure of family farms in Poland by size, 2002 and 2010.

Specification	Year	Total	Size groups (ha of agricultural land)					
			1-5	5-10	10-15	15-30	30-50	≥ 50
Structure of farms	2002	100.0	58.7	21.9	9.4	7.8	1.6	0.8
	2010	100.0	55.2	22.5	9.8	8.6	2.3	1.6
Change in number of farms in the period 2000-2010 (%)		-20.1	-25.9	-17.6	-16.6	-10.7	13.7	42.1

Data source: GUS (2013)

labour-saving, the economic strength of farms is increasingly dependent on the existing skills of farm managers and their ability to acquire new skills (Terluin and Post, 2000). At the same time, the potential to increase the non-agricultural economic activities of farming family members depends on their educational level since improved qualifications make off-farm employment more likely, thereby reducing agricultural employment as well as the number of redundant persons on the farm (that represent hidden unemployment in the agricultural sector)⁴.

In this paper we investigate whether land the concentration process in Polish agriculture is being followed by changes in farm structure and the socio-demographic characteristics of the farming population as well as in labour relations (inputs). Increasing the area of farms and optimisation of farm labour are autonomous processes and reflect the internal development forces present in agriculture. The outcome of these trends from the macroeconomic perspective are structural transformations in agriculture (Tomczak, 2005) that determine the future competitiveness of the agri-food sector in Poland and in countries with similar farm structures. We hypothesise that land concentration is followed by improvement in labour quality and rationalisation (optimisation) of the use of own labour resources. At the same time, we argue that, apart from registered unemployment, a significant number of farming family members may be considered redundant from the point of view of farming activities (and represent hidden unemployment in the agricultural sector). We try to apply subjective and objective criteria to identify the scale of this phenomenon.

Methodology

Our research findings are based on various sources of available data, the main empirical material being the results of the regular field surveys conducted by the Institute of Agricultural and Food Economics – National Research Institute (IERiGŻ-PIB) in Warszawa, mostly from the 1996, 2000, 2005 and 2011 studies. The survey covers all agricultural holdings with more than 1 ha of agricultural land at the disposal of natural persons, namely individual agricultural farms, being in fact family farms (Zegar, 2008), located in 76 villages across Poland. Those locations were deliberately selected to make the size of the analysed farms proportional to the actual area structure, both at the national level and across regions. The surveyed units accounted for around 1 in

500 of all family farms, and in 2011 survey their number was approximately 3,300. The survey questionnaire was designed to collect a great variety of detailed information, not only on the features of the farms, but also on their demographic characteristics, the educational level, economic activities of managers and their family members.

The large number of farms included in the analysed sample, the wide range of collected material and the application of the same research method each year, which was the precondition for the continuity and comparability of data, has enabled a multidimensional analysis of labour in family farming. Empirical data from field studies used in the analysis concerned the economic year or the status at its end. These were, accordingly, 1999/2000, 2004/2005 and 2010/2011, which are referred to below as the years 2000, 2005 and 2011.

The empirical material from field studies was combined with selected Polish Central Statistical Office (GUS) data from the 2002 and 2010 National Agricultural Censuses.

Results

Changes in farm structure and processes of land concentration

During the pre-EU accession period and the first years of Poland's membership of the EU, relatively large structural changes took place in Polish rural areas and agriculture. In the period 2002-2010 the number of individual farms, which includes entities with an area of more than 1 ha of agricultural land, decreased from 1,951,700 to 1,558,400, an average loss of 2.5 per cent each year (Table 1).

The changes in the numbers of farms varied according to their area (Table 1). The number of entities with up to 30 ha of agricultural land decreased, with the largest loss (26 per cent) occurring in the group of farms with up to 5 ha of agricultural land. These latter farms usually could not provide sufficient work and livelihood for an average agricultural family but, despite these changes, they continue to constitute the most numerous community (55 per cent of all individual farms). Different trends can be seen for farms with at least 30 ha of agricultural land which are capable of further economic development. In total, the number of entities in this group increased by 24 per cent. The increase was even higher in the group of farms with 50 ha or more. However the share of the total agricultural area of the larger farms remains small: in 2010 the share of individual farms with at least 30 ha of agricultural land was 3.9 per cent, while for farms of 50 ha and larger the figure was 1.6 per cent.

The analysis of changes in the structure of land use by family farms shows that the slight decrease (from 13.6 to 13.4

⁴ Hidden unemployment is the underestimation of unemployment levels in labour statistics, where only those who are 'actively looking for work' are counted as unemployed. Rural labour markets are 'tight', i.e. characterised by imperfect information and high transaction costs (Hurst *et al.*, 2005). There is a tendency for those who are redundant on the farm to give up looking for off-farm jobs, and to work on the farm for less time that they would like.

Table 2: Structure of agricultural land use by family farms in Poland by size, 2002 and 2010.

Specification	Year	Total	Size groups (ha of agricultural land)					
			1-5	5-10	10-15	15-30	30-50	≥ 50
Structure of agricultural land use	2002	100.0	18.6	20.3	14.9	21.1	9.5	15.6
	2010	100.0	16.3	18.7	13.8	20.3	10.1	20.8
Change in the period 2002-2010 (%)		-1.5	-13.6	-9.4	-9.2	-5.5	4.2	31.5

Data source: GUS (2013)

million ha) in the total area of agricultural land at their disposal was accompanied by large differences in this process between area groups (Table 2). In the period 2002-2010 the area of agricultural land occupied by the group of entities of up to 30 ha fell by 9 per cent. Despite the decrease, however, in 2010 farms of up to 5 ha arable land still accounted for 16 per cent of the total area of agricultural land in individual farms (c.f. 19 per cent in 2002). By contrast, the area of land at the disposal of farmers with farms of 30 ha of agricultural land and more increased by 19 per cent. The share of agricultural land in entities with the possibility to meet the conditions of growing competition increased from 25 to 31 per cent.

Socio-economic characteristics of the farming population

According to IERiGŻ-PIB field studies, in 2011 the demographic structure of the group living on family farms continued to be favourable (Table 3). However, although in that year the population aged 18-44 represented the largest group (40.6 per cent), in comparison with 1996 there was a significant increase (from 18.4 to 25.4 per cent) in the share of other working age persons (aged over 44) and a decline (of over 10 percentage points) in the pre-working age population. The post-working age population has remained virtually unchanged. This shows that rural areas may be affected by problems related to the ageing population in the future.

Performance assessments of agricultural holdings in a competitive environment frequently raise the issue of the relatively low educational level of the farming population.

Table 3: The age structure of the population from family farms in Poland, 1996-2011, per cent.

Year	Pre-working age ^{a)}	Working age ^{b)}		Post-working age ^{c)}
		Age of mobility ^{d)}	Age of non-mobility ^{e)}	
1996	27.8	38.4	18.4	15.4
2000	26.1	39.2	20.1	14.6
2005	22.1	40.0	22.7	15.2
2011	17.6	40.6	25.4	16.4

Economic age groups according to GUS: a) persons aged 17 or under; b) women aged 18-59 and men aged 18-64; c) women aged 60 or over and men aged 65 or over; d) persons aged 18-44; e) women aged 45-59 and men aged 45-64

Data sources: IERiGŻ-PIB field studies 1996, 2000, 2005 and 2011

It results from years of young people's career choices, unfavourable for agriculture. Furthermore, involvement in work on the family farm has often been dependent on the family situation rather than on actual qualifications.

Over the period 2000-2011 there was an improvement in the educational level of members of farming families in Poland, with regard to general education (Table 4). Higher values were observed for all levels of post-primary education, but the improvement was particularly evident in the case of higher education (up from 2 to 12 per cent), as well as for secondary (technical secondary school and high school) and post-secondary education (up from 17 to 31 per cent). Despite those positive changes, in 2011 more than 26 per cent of farming family members continued to have only general education at primary level, whereas 30 per cent graduated from basic (two/three-year) vocational school (Polish: *zasadnicza szkoła zawodowa*). However, between 2000 and 2011 there was also an increase in the share of persons with non-agricultural education, up from less than 43 to 55 per cent. At the same time, the share of persons who completed agricultural (both vocational and higher) education remained virtually unchanged, at around 13-14 per cent.

Along with those changes, the diversification of the economic activity of the farming population in Poland has notably strengthened. This was largely due to increasing employment opportunities in Poland and abroad. As a result, 57.4 per cent of the working members of farming families in 2011 were engaged only in their own agricultural activity and 13.0 per cent exclusively off their family farm (Table 5). Over the period 1996-2011, the share of the employed from farming families combining their economic activity with working on and off their units – although previously stable – increased slightly, from 22.8 to 29.6 per cent.

Table 5: Workplace of the population aged 15 or over from family farms in Poland, 1996-2011, per cent.

Year	Working exclusively on the farm	Combining on-farm and off-farm employment	Having only off-farm jobs
1996	74.0	22.8	3.2
2000	72.4	23.4	4.2
2005	66.3	24.1	9.6
2011	57.4	29.6	13.0

Data sources: IERiGŻ-PIB field studies 1996, 2000, 2005 and 2011

Table 4: The educational level of the working age population from family farms (including persons aged 15 or over who have completed their education) in Poland, 2000-2011, per cent.

Year	General education				Vocational education	
	Primary	Basic vocational	Secondary and post-secondary	Higher	Agricultural	Other
2000	41.4	39.3	17.1	2.2	14.4	42.6
2005	33.9	37.5	23.3	5.0	15.0	48.2
2011	26.4	30.1	31.5	12.0	13.2	54.9

Data sources: IERiGŻ-PIB field studies 2000, 2005 and 2011.

Transformations in the structural distribution of the population by place of work were continuous in nature and clearly intensified after 2000. They indicate that a growing number of people from farming families have begun actively to seek employment alternatives, often completely giving up work on a family farm. There are trends on agricultural holdings to rationalise employment and hire only the human resources that are needed. This process is illustrated by the decreasing number of family members engaging in farm work. This is also confirmed by the declining importance of family farming as a place of economic activity for the rural population and especially as an exclusive place of work.

In 2011 the majority (87.0 per cent) of economically-active farming family members aged 15 or over continued to work in their agricultural holdings, this being the only place of employment for over half of them (57.4 per cent). Nevertheless, the share of people contributing to work on their own farm during the period 1996-2011 decreased on average by 0.7 percentage points per year, while the share of people from farming families engaged in work on a farm declined on average by 1 percentage point per year over the period 2000-2011. As regards those working only in a family agricultural holding, the corresponding rates were about 1.1 and 1.4 percentage points, respectively.

Furthermore, our research shows that the drop in the population engaged only in agricultural activity also led to changes in terms of the amount of work performed (Figure 1). These the share of permanent, full-time farm workers fell from 64.2 in 1992 to 39.9 per cent in 2011 and this was

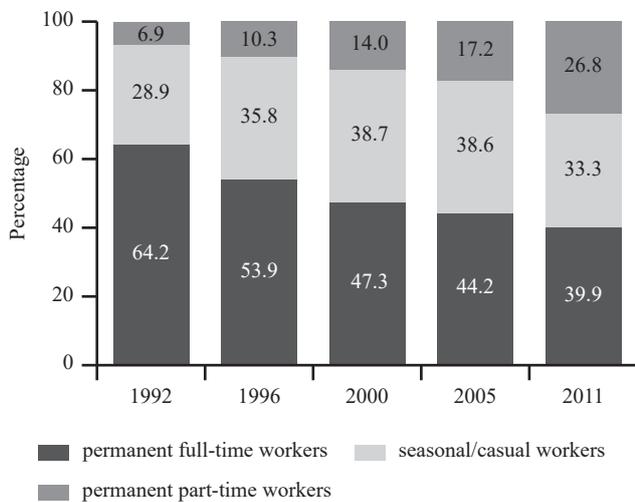


Figure 1: On-farm employment of the population from family farms in Poland, 1992-2011, per cent.

Data sources: IERiGŻ-PIB field studies 1992, 1996, 2000, 2005 and 2011

accompanied by a substantial increase (from 6.9 to 26.8 per cent) in the share of those seasonally or occasionally engaged in agricultural activity. This was associated mainly with a lower level of involvement of the youth, women and post-working age people in family agricultural activity, reflecting the rationalisation processes in labour use. During the period 1992-2011 there were no major changes in the share of permanent farm workers who worked fewer than 8 hours a day (down from 28.9 to 33.3 per cent).

Changes in the economic activity of the farming population, particularly the declining importance of a family farm as a place of economic activity for its residents, are also reflected in decreasing agricultural labour inputs. In accordance with data from field studies, the period 2000-2011 witnessed another decline in agricultural labour inputs similar to that seen in the final decade of the 20th century. Between 2000 and 2011 this value dropped from 15.3 to 10.0 AWU per 100 ha of agricultural land, i.e. by 34.6 per cent (Table 6). This means that over this period the rate decreased on average by 3.1 percentage points per year, compared to 2.6 percentage points in the period 1992-2011.

The relatively high propensity in Poland to rationalise employment on family farms which has been observed after 2000 can be primarily attributed to:

- An increase in the advancement of land concentration. Data from field studies show that the average area of an agricultural holding grew on average by 1.3 per cent per year (from 8.5 to 9.7 ha of arable land) in the period 2000-2011 compared to 0.9 per cent in the years 1992-2000.
- An increase in the number of large farms. The share of holdings of 30 ha or more among the holdings surveyed was 5.6 per cent in 2011, compared to 4.2 per cent in 2005, 2.9 per cent in 2000, 2.1 per cent in 1996 and just 1.1 per cent in 1992.
- Improved technical infrastructure of farms, especially machinery and equipment enabling comprehensive mechanisation of agricultural production, whose emerging effects reduced the demand for labour. Data from field studies show that the share of well-equipped households with tractors increased from 16 to 33 per cent between 2000 and 2011. This also confirms advances in mechanisation in the entire manufacturing process. At the time, the number of holdings with a set of machines allowing for mechanisation of the whole technological process increased by almost 25 per cent. These changes took place almost three times faster than throughout the 1990s.

Table 6: Labour inputs of the population from family farms in Poland, 1992-2011.

Year	Annual Work Units (AWUs)				Change (1992=100)			
	Total per		Including own work per		Total per		Including own work per	
	farm	100 ha agricultural land	farm	100 ha agricultural land	farm	100 ha agricultural land	farm	100 ha agricultural land
1992	1.50	20.0	1.45	19.5	100.0	100.0	100.0	100.0
1996	1.42	17.2	1.37	16.6	94.7	86.0	94.5	85.1
2000	1.33	15.3	1.27	14.7	86.7	76.5	86.7	75.4
2005	1.19	12.4	1.13	11.8	79.3	62.0	77.9	60.5
2011	0.96	10.0	0.93	9.7	64.0	50.0	64.1	49.7

Data sources: IERiGŻ-PIB field studies 1992, 1996, 2000, 2005 and 2011

These transformations were also stimulated by increased opportunities for economic migration, mainly to the EU-15 Member States.

The decline in labour inputs in individual agricultural holdings was due to a drop in labour inputs of family members, as family labour force dominated total labour inputs in agricultural activity. In general, the significance of hired labour remained minor. These trends are confirmed by both general statistical data and the results of the IERiGŻ-PIB field studies. Moreover, after an increase (from 2.3 to 5.0 per cent) between 1992 and 2005 in the share of external labour force in total agricultural labour inputs in the individual agricultural holdings surveyed, the trend reversed. In 2011, the share dropped to 3.7 per cent.

Hidden unemployment in family farming

Our survey findings allow the application of objective criteria to the identification of the category of redundant persons, and thus the rate of hidden unemployment in family farming in Poland. We measure this phenomenon using two different approaches: the farm managers' opinions about the number of family members redundant in farming and the objective working time criterion. The criterion of unutilised working time was considered the most appropriate tool to determine the scale of this phenomenon. The group of individuals considered redundant included all working-age persons who worked only or mostly on the family farm, engaged in agricultural activities for three months per year or fewer, and also in the case of longer working periods, but involving no more than three hours a day.

According to the working time criterion, redundant persons accounted for 20 per cent of the total working age farming population, this being larger than the figure derived on the basis of the farm managers' assessments, which was slightly more than 7 per cent (Figure 2). In all size groups of agricultural holdings the differences between the two measures were relatively large: in all cases the share of redundant persons identified according to the farm managers' assess-

ment was less than half the figure determined on the basis of the working time criterion. Therefore, in addition to registered unemployment (mostly concerning the non-farming population) of about 0.9 million residents of the countryside in mid-2011, approximately 500,000 persons may be considered as redundant from the point of view of farming activities (which represents an estimate of hidden unemployment in the agricultural sector).

Discussion

Our results show that the decline in the number of family farms in Poland has accelerated significantly. The rate of loss of individual farms during the period 2002-2010 (2.5 per cent on average each year) was approximately double that of the previous decade (Sikorska, 2013). In addition, field studies show that the tendency to liquidate farms was strengthened after Poland's accession to the EU. According to these data, the period 2005-2011 witnessed the loss of 55 per cent more farms on average each year than the years 2000-2005 (Karwat-Woźniak, 2012). Taking into account the fact that changes in the area structure are usually evolutionary, the recorded decrease in the number of farms is significant and indicates progress in the rationalisation of agricultural structures, the professionalisation of economic activities in the rural population and, most importantly, creates the possibilities of a more effective use of agricultural land and a better use of the economies of scale to improve the competitiveness of Polish family farms (Sikorska and Karwat-Woźniak, 2012).

Changes in the number of family farms have been paralleled by processes of land concentration. The dynamics of land concentration is the result of numerous factors, and the analysis of the intensity of this process in particular time periods demonstrates that they were mainly related to the general economic conditions and their impact on the non-agricultural job market situation as well as the economic situation in agriculture. This thesis is reflected, among others,

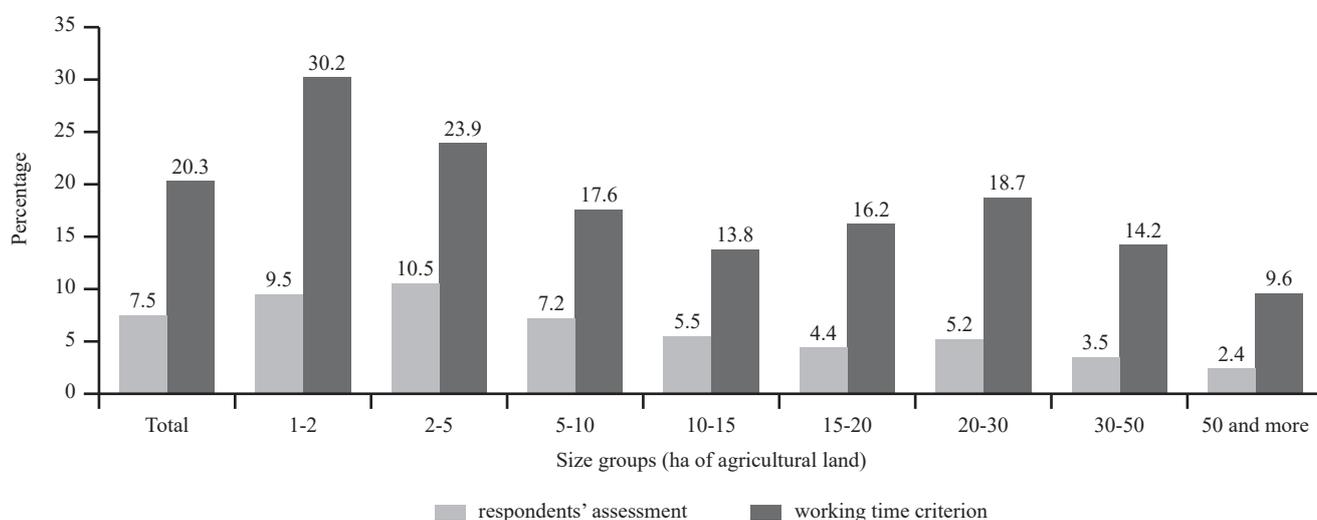


Figure 2: Share of redundant persons in the working age population from family farms in Poland by farm size, 2011, according to respondents' assessments and working time criterion, per cent.

Data source: 2011 IERiGŻ-PIB field study

in a clear strengthening of the process following Poland's accession to the EU which resulted in the increase in the profitability of agricultural production. At the same time, the requirements of EU markets resulted in the need to introduce technological changes to the process of manufacturing agricultural raw materials, to increase the scale of production and improve product quality. These factors, as well as EU subsidies directly related to the area of cultivated land, and EU funds for projects related to the development of rural and agricultural areas, changed the attitude of Polish farmers regarding the land area of owned farms. These attitudes were also affected by the situation on the agricultural land market as well as the possibilities of being employed outside agriculture.

As a result, the average area of an individual farm in Poland increased on average by 3.2 per cent per year in the period 2005-2011. As compared to previous years, this increase should be considered very high. In 1990-2005 an average area of an individual farm increased by nearly 1.4 per cent annually (in the period 2000-2005 – by 0.9 per cent). But the average farm area is still much smaller than that which can create the conditions of competitiveness (Zegar, 2009a), and several times smaller than in countries with which Polish farms compete due to the assortment of production, for example Germany (40.6 ha). Polish agriculture is still characterised by one of the worst area structures of agricultural farms in Europe, as well as an unfavourable structure of use. In terms of the area structure of farms, the only other EU Member States similar to Poland are Italy, Lithuania and Portugal. In Member States characterised by the most optimal area structure (Denmark, Ireland, Germany) the share of farms to up to 5 ha of agricultural land did not exceed 10 per cent and they disposed of no more than 1 per cent of all agricultural area.

However, the possession of land by family farms in Poland is being systematically improved. This tendency is reflected in the increase of the average farm area. From the beginning of the transition period (1990) to 2013 the average area of a statistical individual farm increased from 6.3 to 9.3 ha, namely by 47.6 per cent, and thus the average annual increase amounted to 2.1 per cent. Furthermore, it should be noted that the structure of land use by entities from particular size groups is more significant than the structure of farms in the assessment of structural changes and their impact on the competitive potential (Poczta, 2013). It is the structure of land use that determines the average production conditions in a particular country (Sadowski *et al.*, 2013).

The share of agriculture in the GDP of Poland declined from 7.2 per cent in 1990 to 3.3 per cent in 2001 (Ziętara, 2003). Therefore, the problem of off-farm employment in rural areas became increasingly important during the first decade of transition, particularly for farming families. Our study shows that the diversification of the economic activity of the farming population has notably strengthened. This was largely due to increasing employment opportunities in Poland and abroad. As a result, we observe a drop in the number of working members of farming families engaged only in their own agricultural activity and significant increase of those working exclusively off their family farm.

The relatively high propensity to rationalise employment

which was observed after 2000 can be primarily attributed to an increase in both the advancement of land concentration and in the number of large farms, as well as the improved technical infrastructure of farms, especially machinery and equipment enabling comprehensive mechanisation of agricultural production, whose emerging effects reduced the demand for labour. Additionally, labour outflows from Poland not only facilitated a drop in the supply of labour, but also stimulated the creation of new jobs, which was associated with the growing demand as regards families whose members were emigrants (Rosiek, 2007; Chmieliński, 2013).

From our results we can also conclude that the socio-demographic structure of the farming population in Poland is still favourable and that the educational level of farming family members has been improving, although it continues to be rather low compared to that of the population. Owing to the complexity of the issue of labour resources and inputs in family farming, this topic represents a major determinant of successful restructuring of the agricultural sector in Poland. Economic activity of the farming population and alternative income sources for farming families are both important elements and prerequisites of rural development. Multiple activities are becoming increasingly widespread (Kaleta, 2005), which determines increased significance of non-agricultural education in rural development. At the same time, owing to technological progress, knowledge and the ability to make use of it, has been gaining in importance as the basis for economic activity, including agricultural activities. This means that both the diversification of income sources and economic efficiency of agricultural holdings are closely related to the quality of human capital, primarily determined by the educational level (Gall *et al.*, 2003).

On the other hand, hidden unemployment in the countryside, even if favourable for the state in the short term (by lowering official unemployment rates), adversely affects restructuring and modernisation processes in agricultural holdings, thus in the whole sector (McLaughlin, 2013). The living costs of persons who are redundant in terms of production activities, as well as of those actually unemployed, are incurred by farming families, not by the state. It is negatively reflected in the economic performance of agricultural holdings and the level of agricultural investment expenditure.

References

- Chmieliński, P. (2013): Ludność wiejska na rynku pracy: zarobkowanie, bezrobocie, przedsiębiorczość i praca za granicą w latach 2005-2011 [The rural population in the labour market: wages, unemployment, entrepreneurship and work abroad in 2005-2011]. Warszawa: IERiGŻ-PIB.
- Cramer, G.L., Jensen, C.W. and Southgate, D.D. (2001): *Agricultural Economics and Agribusiness* (8th edition). New York: John Wiley & Sons.
- Gall, M.D., Gall, J.P. and Borg, W.R. (2003): *Educational research: An introduction*. Boston MA: Allyn & Bacon.
- Gardner, B.L. and Rauser, G.C. (eds) (2001): *Handbook of Agricultural Economics, Volume 1A: Agricultural Production*. Amsterdam: North-Holland.
- GUS (2013): *Rocznik Statystyczny Rzeczypospolitej Polskiej* [Statistical Yearbook of Poland]. Warszawa: Polish Central Statis-

- tical Office.
- GUS (2014): Mały Rocznik Statystyczny [Statistical Yearbook]. Warszawa: Polish Central Statistical Office.
- Hurst, P., Termine, P. and Karl, M. (2005): Agricultural workers and their contribution to sustainable agriculture and rural development. Food and Agriculture Organization, International Labour Organization and International Union of Food, Agricultural, Hotel, Restaurant, Catering, Tobacco and Allied Workers.
- Johnson, D.G. (2002): The declining importance of natural resources: lessons from agricultural land, Resource and Energy Economics **24**, 157-169. [http://dx.doi.org/10.1016/S0928-7655\(01\)00046-X](http://dx.doi.org/10.1016/S0928-7655(01)00046-X)
- Kaleta, A. (2005): Wielozawodowość na obszarach wiejskich – perspektywa globalizacji [Multi-skilling in rural areas - perspective of globalisation], in J. Wilkin (ed.), Polska wieś 2025. Warszawa: Fundusz Współpracy, 128-130.
- Karwat-Woźniak, B. (2012): Przeobrażenia w strukturach społecznych i produkcyjnych wsi i rolnictwa w latach 2000-2011 w świetle badań terenowych [The transformations in social and production structures rural areas and agriculture in the years 2000-2011 in the light of the fieldwork], in W. Józwiak (ed.), Wzmacnianie pozycji polskiego rolnictwa – propozycje wstępne. Volume no. 65, Warszawa: IERiGŻ-PIB, 34-56.
- McLaughlin, E. (2013): Understanding Unemployment: New Perspectives on Active Labour Market Policies. London-New York: Routledge.
- Mrówczyńska-Kamińska, A. (2008): Przemiany i znaczenie agrobiznesu w gospodarce narodowej Polski w latach 1995-2006 [Change and the importance of agribusiness in the Polish national economy in the years 1995-2006]. Warszawa: Wieś Jutra.
- Nurzyńska, I. (2014): Przemiany struktury gospodarki wiejskiej [Transformation of the structure of the rural economy], in: Polska wieś 2014, Raport o stanie wsi, Nurzyńska I. and Poczta W. (eds.), Warsaw: SCHOLAR, 125-152.
- Poczta, W. (2013): Przemiany w rolnictwie ze szczególnym uwzględnieniem przemian strukturalnych [Changes in agriculture with particular emphasis on structural changes], in J. Wilkin and I. Nurzyńska (eds), Polska wieś 2012, Raport o stanie wsi. Warszawa: SCHOLAR, 65-66.
- Rosiek, J. (2007): Procesy migracyjne w Unii Europejskiej a funkcjonowanie rynku pracy w Polsce [Migration processes in the European Union and the functioning of the labour market in Poland], in D. Kopcińska (ed.), Wykorzystanie zasobów pracy we współczesnej gospodarce. Szczecin: Uniwersytet Szczeciński, 83.
- Sadowski, A., Baer-Nawrocka, A. and Poczta, W. (2013): Gospodarstwa rolne w Polsce na tle gospodarstw Unii Europejskiej – wpływ WPR, PSR 2010 [Farms in Poland against agricultural holdings in the European Union – impact of the CAP]. Warszawa: Polish Central Statistical Office.
- Sikorska, A. (2006): Źródła utrzymania rodzin użytkujących gospodarstwa rolne [Sources of income of farming families]. Komunikaty Raporty Ekspertyzy no. 523, Warszawa: IERiGŻ-PIB.
- Sikorska, A. (2013): Przemiany w strukturze agrarnej indywidualnych gospodarstw rolnych [The changes in the agrarian structure of individual farms]. Warszawa: IERiGŻ-PIB.
- Sikorska, A. and Karwat-Woźniak, B. (2012): Transformations under the conditions for the development of Polish agriculture. Agricultural Sciences **IV** (9), 97-104.
- Terluin, I.J. and Post, J.H. (2000): Employment dynamics in leading and lagging rural regions, in I.J. Terluin and J.H. Post (eds), Employment Dynamics in Rural Europe. Den Haag: CABI Publishing, 13. <http://dx.doi.org/10.1079/9780851994994.0001>
- Tomczak, F. (2005): Gospodarka rodzinna w rolnictwie. Uwarunkowania i mechanizmy rozwoju [Family economy in agriculture. Conditions and mechanisms of development], Warszawa: IRWiR-PAN.
- Woś, A. (1998): Wzrost gospodarczy i strategie rozwoju polskiego rolnictwa. Eseje 2 [Economic growth and development strategies of Polish agriculture. Essays 2] Warszawa: IERiGŻ-PIB.
- Woś, A. (2001): Rolnictwo polskie wobec procesów globalnych w gospodarce [Polish agriculture and global processes in the economy], Studia i Monografie vol. 105. Warszawa: IERiGŻ-PIB.
- Wrzaszcz, W. and Zegar, J.St. (2014): Sprawność ekonomiczna wybranych farm rolnictwa zrównoważonego środowiskowo [Economic efficiency of some forms of environmentally sustainable agriculture], in J. Zegar (ed.), Z badań nad rolnictwem społecznie zrównoważonym (23), PW 2010-2014. Volume no. 100. Warszawa: IERiGŻ-PIB, 9-38.
- Zegar, J.St. (2008): Dochody w rolnictwie w okresie transformacji i integracji europejskiej [Revenue in agriculture in the period of transition and European integration]. Warszawa: IERiGŻ-PIB.
- Zegar, J.St. (2009a): Struktura polskiego rolnictwa rodzinnego pod koniec pierwszej dekady XXI wieku [Structure of the Polish family farming at the end of the first decade of the twenty-first century]. Warszawa: IERiGŻ-PIB.
- Zegar, J.St. (2009b): Sytuacja ekonomiczna polskiego rolnictwa po akcesji do Unii Europejskiej [The economic situation of Polish agriculture after accession to the European Union]. Warszawa: IERiGŻ-PIB.
- Ziętara, W. (2003): Wydajność pracy w rolnictwie i w różnych typach gospodarstw rolniczych [Labour productivity in agriculture and different types of farms]. Roczniki Naukowe Stowarzyszenia Ekonomistów Rolnictwa i Agrobiznesu **V** (1), 312-317.