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## CHANGES IN THE SOCIO- ECONOMIC CHARACTERISTICS OF PERSONS EMPLOYED IN THE POLISH AGRICULTURE UNDER THE CONDITIONS OF GROWING COMPETITION

**ABSTRACT.** The Polish agriculture is still characterised by considerable structural fragmentation. Activation of the desired transformation is more and more often connected to the quality of human capital. The characteristics of persons working on a farm not only condition the achievement of a competitive advantage, but also the possibility to increase the level of their non-agricultural activity. These circumstances precondition the pro-effective reconstruction of the production structures of the Polish agriculture. Ipso facto the aim of this paper is to show that the changes in the group of people employed in family farming permanently at a full-time level imply the chances of agricultural structures improvement. At the same time, the characteristics of persons who are unused labour resource potential make their inter-sectoral mobility more probable. The paper uses mainly the results of IAFE-NRI's research carried out on a sample of ca. 0.2% of the actual number of individual farms. On the basis thereof it was stated that the rise in competition has contributed to the processes of work professionalization in the Polish agriculture. Despite some signs of aging of the family labour force it may still be considered relatively young. The level of schooling improved both for persons permanently employed on a full-time basis, as well as persons considered as redundant on a farm. This will most likely act in favour of modernisation processes in agriculture, diversification of economic activity and outflow of people from agriculture.

**JEL Classification:** J19, J24,  
J43

**Keywords:** persons working on family farm: permanently at a full-time level and seasonal, demographic structure, level of general and professional education, farm redundant labour force.

### Introduction

At present, intangible factors of economic development are becoming increasingly important. These trends are visible also in agriculture where technological development

changes the proportions of the use of production factors, such as land, capital, labour and management. At the same time, the importance of information, knowledge and creativity of persons involved in production activity increases (Klepacki, 2005). This means that people are more and more often crucial for efficient use of production resources and success of the pursued economic activity (Coleman & Grant & Josling, 2004). Their knowledge, ingenuity, ability to gather and process information and seek new, more efficient solutions determine the dynamics of development (Kowalski, 1998) and decide on the improvement of competitive capacities (Wołoszyn, 2004). Therefore, today the most valued personal traits are resourcefulness, competence, skills and those that require continuous improvement to achieve success in the pursued economic activity (Radziukiewicz, 2013). Moreover one of the determinants of the process of multifaceted rural development is the improvement of the quality of human capital. It preconditions the launching of positive transformation processes in the agricultural sector and on rural areas, including also changes in the structure of populations working in agriculture and outside of it (Becker, 1993).

The progressing elimination of barriers restricting economic confrontation of entities causes an increase in global competition, which is more and more pronounced also as regards farms. This forces continuous restructuring and modernisation of the entities from the Polish agricultural sector in order to efficiently adjust them to the changing economic circumstances (Kowalski & Rembisz, 2005). Since in the setting of ongoing globalisation the macro-economic conditions are increasingly important for agricultural producers and only those who can face the competition, depending on marginal efficiency relationships, will survive on the market (Czyżewski, 2007).

Common Agricultural Policy (CAP) does not allow to cover with global processes the agriculture of European Union (EU) countries. The need for transformations resulting in sustainable competitiveness of the EU agriculture on the global market with simultaneous reduction in export subsidies is more and more often discussed (Czudec, 2008). The achievement of this aim largely depends on raising internal competitiveness through optimal use of production factors and reduction of production costs. Better use of production potential (especially of land and labour resources) depends also on the progress as regards diversification of professional activity of the rural population. This is the task that farms in each Member State, hence also Poland have to face (Maurel, 2005).

At the background of the EU countries, Poland has relatively significant resources of agricultural land and therefore it has the means to become an important producer of agricultural commodities. But concentration of a large part of production resources on farms carrying out small-scale agricultural activity is a weakness of the Polish agriculture (Poczta, 2010). What is more, the size of agricultural production determines the economic strength of individual farms (Woś, 1998).

The micro-economic weakness of the majority of farms establishes rather poor sectoral position of the Polish agriculture at the background of the single agricultural market (Poczta, 2010). Although the desired changes gradually take place in the Polish agriculture, from the perspective of its improved economic situation, the potential competitiveness of the sector still does not give strong basis for international competitiveness (Poczta, 2010). In this case the Polish agriculture requires further and relatively more dynamic changes in the field of agrarian structure, largely aimed at structuring the segment of economically strong farms. Relevant number of this category of entities<sup>1</sup> not only creates the possibility to secure, in quantitative and qualitative terms, the market of agricultural products and effectively compete on the international area by Polish agricultural producers, but it also contributes to socio-economic equilibrium and provides a basis for sustainable rural development (Karwat-Woźniak, 2009).

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<sup>1</sup> In the study the terms farm and entity are used interchangeably.

The pace of structural transformations in agriculture is the resultant of the impact of many factors, among which e.g. the characteristics of socio-demographic structures are the more significant ones. Demographic phenomena (including in particular birth rate) are the autonomous factors, but the characteristics of the population (age, sex, level of education) may under specified conditions stimulate or hinder the processes of pro-development transformations in agricultural structures. The interdependence in the formulation of economic and social processes has the characteristics of feedback, which in turn influences the pace and character of changes.

Family farm is a specific workspace since it functions mainly on the basis of the work of the user and his/her family members (Zegar, 2009) with rational use thereof (Woś, 2004). On that account and given the specific characteristics of production processes in agriculture, significant differentiation as regards participation of individual persons in works is rather common, just like large share of persons performing auxiliary activities and working for a limited period of time (Chmieliński & Karwat-Woźniak, 2007). This group, given the nature of tasks performed on the farm and relatively insignificant involvement in production activity, has a small share in the creation of the final effect of the pursued agricultural activity. Thus it may be considered that, basically, this group is redundant from the perspective of smooth working of the farm. Moreover, the group of individual farms failing to generate agricultural income increases gradually (Karwat-Woźniak & Chmieliński, 2013). These situations follows from the need to speed up the process of taking up employment outside of the individual farm. The issue of reducing employment in agricultural activity and shifting the labour force resources from agriculture to non-agricultural sections preconditions the improvement of the agrarian structure, increase in effectiveness of farming and improvement of the income situation of not only farmers (Tomczak, 2005), but also other rural residents (Karwat-Woźniak & Chmieliński, 2013). The process of population outflow from agriculture is also a factor contributing to modernisation of the entire economy (Tomczak, 2005).

The Polish economy, despite the progressing de-agrarianization, is still characterised by relatively significant employment in agriculture and rather wide-spread cases of double-employment (Chmieliński, 2013). According to the latest Central Statistical Office data in 2010, the population providing labour input into agricultural activity conducted by an individual farm<sup>2</sup> and not receiving remuneration for it numbered 3,669.4 thousand persons. For 65.9% of them (nearly 2,407.0 thousand persons) the family farm was the only place of professional activity, while further 34.4% (nearly 1,262.5 thousand persons) also had gainful employment outside agriculture (Pracujący w gospodarstwach rolnych, 2012). If their labour is expressed in full-time equivalent<sup>3</sup>, the number of working persons amounts to 1,777.7 of full-time employees and this was a figure by 8.7% lower than three years earlier (Karwat-Woźniak & Chmieliński, 2013). Despite this, employment in the sector of individual farming is still very high. Over-employment translates, *inter alia*, into low labour productivity in the agricultural sector and low income from work on a family farm (Gadomski, 2011).

The continually growing role of intangible factors in the today's process of economic development largely changes the conditions of competitiveness and, simultaneously, creates new challenges. Generalisation of the paradigm of human capital significance in the production processes resulted e.g. in noting the increasing importance of socio-demographic characteristics of the population as regards determining the conditions of progress in restructuring the agricultural structures in Poland, and the possibility of taking up professional activity outside the family farm (Wołoszyn & Ratajczak, 2007). This makes us more inclined

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<sup>2</sup> Individual farms having the areas of more than 1 ha of agricultural land are termed as “individual farms”, whereas they are in fact family farms.

<sup>3</sup> This means that 1 person works on a farm for 2,120 hours per year, i.e. that person has worked 8 hours a day for 265 working days. This is a calculation of a full-time equivalent, full-time employees.

to characterise the population employed in agricultural activity both from the perspective of obtaining competitive advantage, and the possibility to increase the level of non-agricultural professional activity. Reduction of the group of persons employed in agricultural production preconditions the pro-effective reconstruction of the structures of the Polish agriculture and the increase in farmers' income.

According to the above this work aims at analysing the changes in the demographic characteristics and the level of education of the population working on family farms by their involvement in the pursued agricultural activity.

The significance of socio-demographic characteristics of the population employed in agricultural activity for the diversification of their professional activity and for structuring of the economic situation of individual farms and thereby the entire sector of agricultural commodities production, inclines us to characterise the aforementioned group from the perspective of basic functions performed by the farm. Since this largely influences the development opportunities of individual entities. This area considers the breakdown according to their market activity, which is reflected in the scale of commodity production.

The conducted analysis uses the available literature, and results presented therein were confronted with the results of own research. The empirical part of research uses data from field research of the IAFE-NRI. These are multi-annual research (4-6 years) conducted on a regular basis for the same 76 villages and all farms situated therein having an area greater than 1 ha of agricultural land administered by natural persons, i.e. individual farms. These localities were selected on purpose, so as to the area structure of researched units reflected the actual size of all individual farms<sup>4</sup>. Whereas in individual agriculture, which increasingly clearly marks its dominance in the Polish agricultural sector<sup>5</sup>, the acreage of a farm is closely related to the level of provision with other components of the production assets and socio-demographic characteristics of farmers (Dudek, 2010; Karwat-Woźniak, 2013), as well as main aims of the conducted agricultural activity (Sikorka, 2007). Therefore it may be stated that the researched group reflects the social and economic structures of the Polish agriculture. Therefore, the size and features of the research sample ensure a representativeness of presented research findings.

The surveyed units each time accounted for ca. 0.2% of the actual number of individual farms and their number in the last research (2011) amounted to 3.3 thousand entities. The labour resources of surveyed farms amounted to 7,2 thousand persons at the age 15 and more, including 4.7 thousand persons worked on farms exclusively.

Using the data from survey two groups were selected from the overall population working exclusively on farm, who were the subject of the analysis:

- The first group was composed of persons largely determining the total effects of the conducted agricultural activity, i.e. permanently employed on a full-time basis on an individual farm<sup>6</sup>, thus persons treating their work as a profession (Sikorska, 1999, 2009). In 2011, this group represented 51.3% of all persons employed only in agricultural activity.
- The second group was represented by a population which, given the amount and type of work performed on a farm, has a relatively small contribution to the production result<sup>7</sup>.

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<sup>4</sup> Despite some conceptual differences this study interchangeably uses the term family farming (farm) meaning individual (family) farming (farm).

<sup>5</sup> According to the Agricultural Census results in 2010 the individual farms accounted to 99.7% of total units engaged in agricultural production in Poland and having 88.6% of total agricultural land (Raport z wyników, 2011). The agricultural activity in individual farms accounted to 97.7% of whole agricultural labour input (Charakterystyka gospodarstw rolnych, 2012).

<sup>6</sup> This group is in the study also termed as farmers linking their professional activity mainly with agriculture or farmers treating their work in agriculture as profession (employed in agriculture).

<sup>7</sup> This group was composed of persons permanently, but not full-time, employed in agricultural activity for not more than 3 hours, or employed in agriculture on a seasonal or temporary basis – for a maximum of 3 months.

These workers are redundant and thus could leave the farms without limiting the amount of agricultural production. Family farm was their only place of professional activity and this resulted primarily from the fact that they had no possibility to take up gainful employment<sup>8</sup>. In 2011, they amounted to 24.3% of the group working only on a farm.

Moreover, apart from above mentioned groups employed exclusively on family farms there is a group providing permanent part-time (4-7) or seasonal work (90-180 days). These group amounted to 24.4% of total persons working exclusively on farm.

The research period covering the 2000-2011 period was determined by the availability of comparable empirical data and the fact of intensive changes in the conditions of operation of farms connected to the processes of integration with the EU economic structures. The empirical data from field research that were used in the analysis each time concerned an economic year. These were, respectively, 1999/2000, 2004/2005 and 2010/2011, which in the work is referred to in short as 2000, 2005 and 2011.

The basic instrument of used in the work is a descriptive analysis using comparative and quantitative methods. To this end, the indicators of the structure and intensity of surveyed phenomena were used as well as the indicators of the vertical and horizontal dynamics.

### 1. Demographic characteristics of persons permanently employed on a full-time basis on individual farms

Many authors (Sikorska, 1999, Woś, 1998) emphasise that relatively young people are most open to changes and development. This also refers to the issues related to transformation of agricultural structures, and primarily the adopted strategies of adjustment of entities working in the production area to the changing conditions of operation. Although the applied adaptation methods are heterogeneous, they can be generally divided into:

- active – consisting in the implementation of projects targeted at increasing the production potential of farms and their competitive capacities, and consequently at pro-effective reconstruction of the structures of agricultural sector; which was reflected in the establishment of the segment of farms capable of efficient competitiveness (Karwat-Woźniak, 2009).
- passive – aimed mainly at further existence following from passive attitudes of their users, which were reflected in the subsistence type of production.

Table 1. Changes in the age structure of persons permanently employed on a full-time basis on individual farms in 2000-2011

Year	pre-working age	Percentage of people in*			post-working age
		mobile	including up to 35	immobile	
2000	0.2	54.8	28.6	38.7	6.3
2005	0.2	52.3	26.1	43.7	3.8
2011	(.)	43.4	21.8	51.2	5.4

\* Economic age groups according to CSO: the pre-working age population – persons aged 17 or under; the working age population – women aged 18-59 and men aged 18-64; the post-working age population – women aged 60 or over and men aged 65 or over. The working age population was subdivided into two groups: the age of mobility population (younger working age population) – persons aged 18-44 – and age of non-mobility population (older working age population) – women aged 45-59 and men aged 45-64. This division is applied throughout the paper.

*Source:* own elaboration on the basis of data from the IAFE-NRI surveys 2000, 2005 and 2011.

<sup>8</sup> For this population the study interchangeably uses the terms: working (employed) on a farm on an occasional (incidental) basis or redundant.

According to the data from field research (*Table 1*), in 2011 the share of age of mobility population amounted to 43.4%, including 21.8% below 35 years of age. However, the share of persons treating employment in agriculture as profession in the aforementioned age groups was clearly lower than in the previous years, which points to some signs of aging of the farmers' population. These trends were more pronounced after 2005.

In 2005-2011 the share of persons at "younger" working age decreased by 8.9 p.p., i.e. from 52.3 to 43.4%, and people aged under 35 from 26.1 to 21.8%, i.e. by 4.3 p.p. In other words, the average loss of this group amounted to 1.48 p.p. and 0.72 p.p. per year, while in 2000-2005 this indicators amounted to 0.50 p.p. At the same time, the group of people treating employment in agriculture as profession has increased as regards older working age. In 2005-2011, the share of this age group among the persons permanently employed on a full-time basis in agricultural activity increased from 43.7 to 51.2%, while in 2000-2005 from 38.7 to 43.7%. Thus the growth rate of this group in the last researched period was by 25% higher than before, since the average annual growth rates of the described population amounted, respectively, to 1.25 and 1.00 p.p.

Above transformations in the farmers' structure according economic age groups, as well as among the whole rural population are a result of flow of these group to the higher age cohorts in the times of baby booms and fertility decline. The increasing symptoms of aging were partially caused by the diversification of farming population economic activity. Non-agricultural jobs were taken mostly by young people.

The analysis of changes in the value of the share of farmers at the retirement age shows that despite the different trends noted in comparable periods the size of this group was relatively small and was characterised by a rather considerable stability. In 2000-2005 there was a slight (from 6.3 to 3.8%) decrease in the share of this age group. While the research data of 2011 show that the share of persons at the retirement age permanently employed on a full-time basis on farms amounted to 5.4%. This means that their share in the last six years increased, but it was still lower than 2000.

On interpreting the changes in the share of persons at the retirement age in the population of persons permanently employed on a full-time basis on farms, it should be stated that the generational change in Polish agriculture runs rather smooth. Apart from circumstances related to legal conditions of acquiring retirement benefits by farmers, this process is increasingly influenced by circumstances linked to the situation on non-agricultural labour market, better economic situation in agriculture and increasing chances to achieve satisfactory income from work on a family farm and the possibility to obtain financial aid for their modernisation.

According to the research findings, it *could* be stated that despite certain visible signs of aging, the population permanently employed on a full-time basis on individual farms may be considered as relatively young. This will probably favour pro-effective reconstruction of the structures of the Polish agriculture. In this group were particularly farm managers (82.5%) and further 5.8% were their successors. At the same time, for 95.4% of persons permanently employed on a full-time basis on farms, farm they used was their only place of professional activity. Apart from the above, work of the population performing mainly agricultural activity invariably dominates in the overall labour inputs to conducting agricultural activity<sup>9</sup>.

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<sup>9</sup> The data of the IAFE-NRI show that in 2011 the work of family members permanently employed on a full-time basis constituted 70.1% of all labour inputs for carrying out agricultural activity in the surveyed individual farms. In 2000 a parallel share amounted to 72.5%.

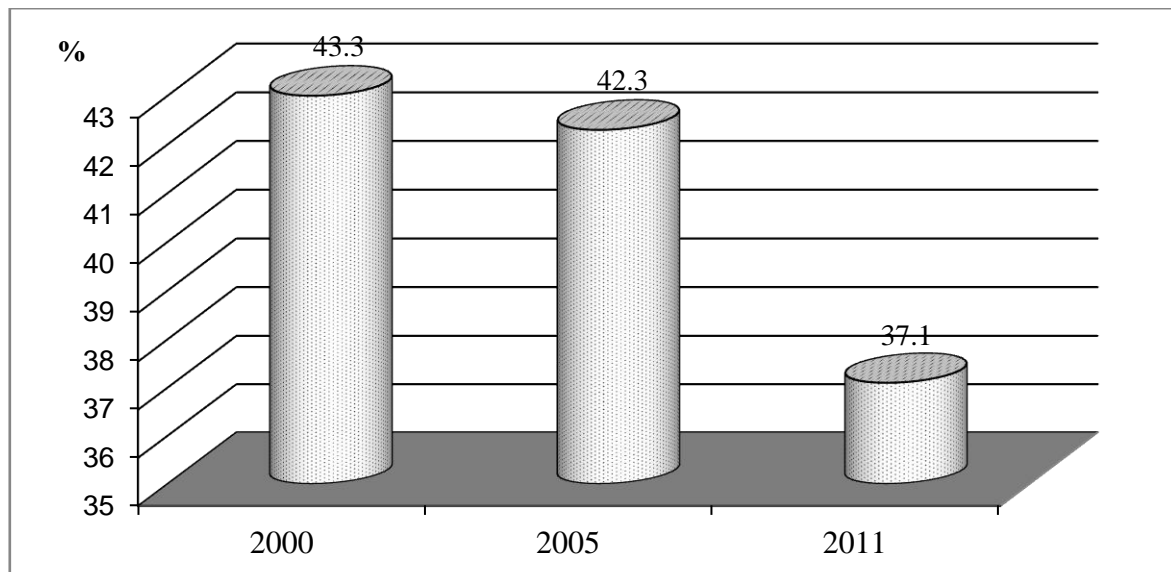


Figure 1. Changes in the share of women permanently employed on a full-time basis on surveyed individual farms in 2000-2011

Source: own elaboration on the basis of data from the IAFE-NRI surveys 2000, 2005 and 2011.

Changes in demographic characteristics of farmers were not limited to their structure by age, but concerned also a division by sex. From the analysis of the share of women in the population performing mainly agricultural tasks it follows that the level of feminisation of this group decreased in the analysed period (*Figure 1*). In 2000, women constituted 43.3% of the total number of persons permanently employed on a full-time basis in agricultural activity, while eleven years later it was only 37.1%.

The presented process of disappearance of women's labour from agricultural production was related both to the decrease in the need for labour (progress in the scale and comprehensiveness of labour mechanisation on a farm), as well as professional attitudes of women and increasingly common drive at separating a household from a farm. These trends are not new and they have appeared earlier (Szemberg, 2001), but they were rather strongly pronounced after Poland's accession to the EU, which was conditional on the improvement of the income situation in agriculture, the possibility of securing the EU funds to modernise and improve the technical equipment of farms and reduction of imbalances on the non-agricultural labour market.

The fact that women gradually leave from the group of persons permanently employed on a full-time basis in agricultural production should be also considered as a manifestation of rationalisation of the work organisation on individual farms, as well as a certain aspect of progressing professionalization of the profession of a farmer.

Table 2. Changes in the age structure of persons permanently employed on a full-time basis on surveyed individual farms by market activity

Farms	Percentage of people aged				
	up to 17	18-44	45-54	55-59	60 and more
years of age					
2000					
- excluding commodity production	0.6	50.7	17.8	7.3	23.6
- including commodity production	0.2	55.2	26.7	6.9	11.0
2005					
- excluding commodity production	1.3	40.1	29.0	15.0	14.6
- including commodity production	0.2	50.9	31.7	12.4	4.8
2011					
- excluding commodity production	-	29.2	31.2	19.9	19.7
- including commodity production	(.)	44.6	33.7	13.3	8.4

Source: own elaboration on the basis of data from the IAFE-NRI surveys 2000, 2005 and 2011.

Analysis of the age structure of farmers by market activity of used farms documented that although the signs of aging of this population were common, their intensity was largely related to market activity (Table 2) and primarily the size of agricultural production placed on the market by individual entities (Table 3). At the same time, the persons permanently employed on a full-time basis on farms conducting only subsistence production (without commercial production) invariably were rather older than similar population employed on market farms (with commercial production), and especially in entities with large scale of sold agricultural production. This situation should be attributed mainly to the fact that the economically stronger farms, especially market oriented units, were more likely to be taken over by a younger persons. Such farms gave a chance to obtain an satisfactory income from agricultural activity. At the same time, the processes of economic activity diversification were more advanced on semi-subsistence farms. Therefore, this farms frequently were without successors.

Table 3. The age structure of persons permanently employed on a full-time basis on researched individual farms by scale of commercial production in 2011

Farms	Share of persons aged					
	up to 17	18-35	36-44	45-54	55-59	60 and more
years of age						
total	(.)	21.8	21.6	33.4	13.7	9.5
- without commercial production	-	12.8	18.4	31.2	17.9	19.7
- with commercial production						
total	(.)	22.8	21.8	33.7	13.3	8.4
with sales						
up to PLN 10 thousand	-	17.4	18.2	34.3	14.5	15.6
PLN 100 thousand and more	-	28.6	24.0	31.6	11.5	4.3

Source: own elaboration on the basis of data from the IAFE-NRI survey 2011.



The research shows that although in the analysed period the age structure of farmers from entities with the same scale of commercial production was differentiated. Generally, according to the research findings the greater the scale of production, the smaller the share of persons at the retirement age and the higher the share of persons at the age of mobility (*Table 3*).

According to the data from surveys, in 2011 only 4.3% of farmers from farms, whose size of conducted agricultural production allowed for getting income from work on the family farm exceeded the average remuneration in non-agricultural activity<sup>10</sup>, were persons aged 60 and more. But this was a share over 3.5 times lower than in the group of farms selling small quantities of agricultural products (conducting only subsistence production)<sup>11</sup> and over 4.5 times higher than a similar indicator in the group of entities conducting only subsistence production. Moreover in the group of persons permanently employed on a full-time basis on farms with relatively large scale of production, young people had a clearly greater share. If as such we recognise persons at the age of mobility then they constituted 52.7% of the total number of persons employed on a full-time basis on a farm with commercial production for PLN 100 thousand and more, and they represented a share by 17.1 p.p. higher than in a similar group of entities conducting mainly subsistence production. Whereas in an identical group of farms not conducting commercial production the share of persons aged 44 was 31.2%. Thus it was by 21.5 p.p. lower than among farmers from farms conducting agricultural production allowing for achievement of satisfactory income.

Discrepancies in the age structure of persons permanently employed on a full-time basis on farms with different market activity strengthened in 2000-2011. This thesis is confirmed not only by a reduction in the share of persons aged 60 and more in the analysed population of farms, whose production size allowed for achievement of satisfactory income and increase in the analogous group of the remaining farms conducting production for the market, but mainly by aggregation of disproportions in the size of this indicator between the compared groups. For example, in 2000 in the group of persons permanently employed on a full-time basis on farms, whose production size allowed for achievement of satisfactory income, 5.9% were persons aged 60 and more and it was a size almost 2 times lower than a similar result in the farms conducting mainly subsistence production, which amounted to 11.2%. Eleven years later a similar difference was by over 2 times greater and comparable indicators amounted to 4.3 and 15.6%, respectively.

The trends presented above that refer to the changes in the age structure of farmers may be indicative of a future faster pace of the flow of agricultural land to larger, economically stronger and market-oriented entities, and consequently to pro-effective reconstruction of the agricultural sector and improvement of its competitive capacities also in the resource aspect. This may be also justified by the more and more popular phenomenon consisting in a lack of persons willing to take over farms. Their former users plan to sell or rent the owned agricultural lands. Although the situation concerns farms continually increasing in terms of area, but still it is largely the problem of entities of relatively small scale of production and, in general, having at their disposal small production potential (Karwat-Woźniak, 2013).

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<sup>10</sup> The size of commodity production defined in this manner in 2011 amounted to PLN 100 thousand and in 2000 – PLN 50 thousand.

<sup>11</sup> Annual value of sales of agricultural products failed to exceed 20% of the average commodity production per 1 surveyed farm. The cut-off value determined in this manner in 2011 amounted to PLN 10 thousand and in 2000 – PLN 5 thousand.

## 2. Level of education of persons permanently employed on a full-time basis on individual farms

The contemporary agriculture meets a number of significant and very diverse functions not only at the economic level, but also at the social and environmental one. Thus the conducted agricultural activity should, apart from market aspects, consider also the social and environmental aspects (Dudek, 2013). Additionally, under the conditions of growing competitiveness the ability to compete efficiently and the level of income from the conducted economic activity are increasingly dependent on the knowledge factor (Klepacki, 2005). Thus today in order to develop persons preparing to take up the profession of a farmer have to enhance their skills and invest in agricultural education. This implies that persons working in agriculture have to face various increasingly growing needs, and meeting them requires comprehensive knowledge (Kowalski, 1998).

An analysis of the available empirical data shows that generational changes in the group of persons permanently employed on a full-time basis on a farm went hand in hand with a higher level of their schooling (*Table 4*). These changes should be considered as very positive since the level of education has a direct impact on the speed and effects of technical and technological innovations implementation in agriculture (Kowalski, 1998).

Table 4. Changes in the level of education of persons permanently employed on a full-time basis on the researched individual farms

Level of education	2000	2005	2011
share of persons by the level of general education			
- statutory*	35.9	26.3	19.0
- basic vocational	46.7	47.3	45.1
- secondary and post-secondary	16.5	23.7	30.8
- higher	0.9	2.7	5.1
share of persons having vocational education			
- agricultural	23.0	24.0	28.3
- non-agricultural	40.0	43.6	50.3

\*Refers to the education at the level of primary and lower secondary school. To this group were added persons who failed to graduate from primary or lower-secondary school. They represented from 0.1 to 0.4% of the total number of the analysed population.

*Source:* own elaboration on the basis of data from the IAFE-NRI surveys 2000, 2005 and 2011.

According to the data from surveys, in 2011 still 19% of persons permanently employed on a full-time basis on a farm completed only a primary or lower secondary school. The share of persons that have finished their education at the statutory level decreased as compare to 2000 by 16.9 p.p. In each of the researched periods basic education was most common as it was declared by 45.1-47.3% of the group. At the same time, a progress at the level of secondary and post-secondary (increase from 16.5 to 30.8%) and higher schools (increase from 0.9 to 5.1%) was noted. The over five-time increase in the share of farmers with higher education noted in 2000-2011 should be considered as significant. Especially in the situation when the return on investment in higher studies in case of agricultural sciences was still the lowest among all fields of study, although it increased gradually from the beginning of the 1990s (Czapiński, 2013).

As for farmers, the professional preparation to perform their work is best evidenced by agricultural education, especially a school one. Thus in order to assess the level of their skills the education giving vocational qualifications should be considered, although in the case of individual farming experience measured with years of work on the farm is also very important

(Pracujący w gospodarstwach rolnych, 2012).

The collected survey data show that in 2000-2011 a slight progress has been noted as regards popularisation of agricultural qualifications at the school level. At that time, the share of farmers who graduated from agricultural schools increased from 23 to 28.3%.

The above-presented positive changes in the level of education were especially visible in the group of persons permanently employed on a full-time basis on market-oriented farms in general larger in terms of area and with large scale of sales. Assuming that the share of persons having at least secondary education is the measure of good education than the larger the farm the higher the level of schooling of farmers.

### 3. Demographic characteristics of persons occasionally employed on individual farms

The pace of pro-effective reconstruction of the agricultural sector is related e.g. with other processes of production assets concentration (especially land), which is conditioned by the pace of liquidation of a part of farms, diversification of professional activity of persons working in agricultural activity, i.e. their outflow from agriculture. The pace of the process is conditioned also by demographic situation of persons involved in works performed on a farm occasionally or redundant from the perspective of the conducted agricultural activity.

According to the survey data, the population of persons involved in occasional works on a farm is increasingly older (*Table 5*). This is most clearly evidenced by the increase in the share of persons aged 55 and more. In 2000, the people in this group constituted 13% of the group considered as redundant from the perspective of conducted agricultural activity and in 2011 a similar indicator already amounted to 25.9%.

Analysis of the age structure of the discussed population by market activity of the used farms demonstrated that invariably persons occasionally working on farms conducting only subsistence production were relatively older than a similar population employed in market farms, and especially in entities having large scale of sales of agricultural production.

There is a general belief that relatively young people are primarily predisposed to changes. This refers also to the possibility (will) of action related to diversification of professional activity. Given the conditions and willingness to take up gainful employment outside one's own farm, persons that are below 55 and declare willingness to work outside their family farm were considered as those that may be used on a non-agricultural labour market.

Table 5. The age structure of persons occasionally working on the surveyed individual farms

Specification	The share of persons aged					
	up to 17	18-35	36-44	45-54	55-59	60 and more
	years of age					
Occasionally working in:						
2000	2.7	29.3	33.1	21.9	3.7	9.3
2005	2.6	33.3	27.3	20.8	4.5	11.5
2011	2.8	37.1	14.9	19.3	7.4	18.5
including in 2011 on farms:						
- without commercial production	1.6	24.3	16.2	24.2	9.0	24.7
- with commercial production	3.7	44.7	14.0	16.4	6.4	14.8
with sales:						
up to PLN 10 thousand	2.1	37.2	17.1	21.7	5.4	16.5
PLN 100 thousand and more	9.9	56.0	6.7	11.5	4.9	11.1

Source: own elaboration on the basis of data from the IAFE-NRI surveys 2000, 2005 and 2011.

According to the above-criterion the group occasionally involved in work on a farm and considered as mobile, from the perspective of the market, represented only a part of persons redundant on the farm. Thus persons whose labour potential may be, under specific conditions, used on non-agricultural market in 2011 amounted to 74.1% of the population redundant from the perspective of conducted agricultural activity.

Whereas the group related to relatively small entities in terms of area (up to 10 ha of agricultural land) predominated and only less than 1% were people from farms having at least 30 ha of agricultural land – where according to model research – there are chances to implement parity level of consumption and respective funds to extended investments and consequently their further development and growth (maintenance) of competitive capacities. At the same time, nearly half of the discussed group lived in families using individual farms without commercial production or sales of agricultural commodities valued below PLN 10 thousand.

#### 4. The level of education of population occasionally working on individual farms

The level of education constitutes the main element determining the quality of human capital and is one of the most important factors influencing the process of socio-economic development. Not only pro-effective transformations in agriculture depend on the factor, but also intersectoral mobility of working persons, i.e. the flow of persons employed in agricultural activity to other sectors of the economy. Thus in today's world enhancement of skills and investments in education precondition development.

Table 6. The level of general education of persons occasionally working on the surveyed individual farms

Specification	Share of persons having general education at			
	the statutory level**	the basic vocational level	the secondary and post-secondary level	the higher level
Total of persons working occasionally* in:				
2000	30.9	42.9	23.3	2.9
2005	24.5	40.4	29.9	5.2
2011	19.4	31.1	40.6	8.9
including in 2011 on farms				
- without commercial production	12.9	33.7	43.5	9.9
- with commercial production	22.4	31.4	40.1	6.1
with sales				
up to PLN 10 thousand	18.7	34.0	38.0	9.3
PLN 100 thousand and more	18.2	28.4	41.9	10.1

\* Covers persons aged up to 54.

\*\* Refers to the education at the level of primary and lower secondary school.

Source: own elaboration on the basis of the IAFE-NRI survey 2011.

From the data on the level of education it follows that the described group of persons redundant in agriculture was characterised by relatively higher level of schooling than those permanently employed on a full-time basis on a farm (Tables 4 and 6). This concerned both general education and vocational qualifications of non-professional profile. These positive conditions were especially pronounced in the group of persons working in subsistence farms, where in 2011 43.5% of persons had secondary and post-secondary education and further 9.9% had university diploma and the same figure had education only at the statutory level. In

case of the population of farms producing to the market parallel shares were 40.1 and 6.1%, respectively.

From the perspective of vocational qualifications, the discussed population of persons redundant in agriculture aged up to 54 was predominated by persons being prepared at school for non-agricultural professions (*Table 7*). In 2011, out of the group 74.8% were prepared at school to professional activity outside of agriculture.

The IAFE-NRI research shows that the above-described group would be willing to take up employment outside their family farm if given such an opportunity. The preferred form of employment is paid labour (ca. 80%). The willingness to take up gainful employment by persons linked to farms is evidenced also by the research on the conditions and quality of life and economic behaviours in households on the example of Podkarpackie Voivodeship conducted by the Statistical Office in Rzeszów. The research showed that in Podkarpackie Voivodeship, which is predominated by small farms, relatively most often active approach, when permanent income failed to satisfy current needs, i.e. taking up additional jobs, was preferred by households of farmers (ca. 44%) and self-employed (ca. 39%). The highest share of the unemployed in Podkarpackie Voivodeship (32%), who were unable to take up a job because of no qualifications, represented persons aged 55 and more. The respondents declared willingness of permanent place of residence more often on rural areas than on urban areas (Czapiński, Łagodziński, 2010).

Table 7. The level of vocational education of persons occasionally working on the surveyed individual farms

Specification	Share of persons having vocational education					
	non-agricultural			agricultural		
	at training courses	at school	without education	at training courses	at school	without education
	Total for the line=100			Total for the line=100		
Occasionally working* in:						
2000	2.8	54.7	42.5	18.4	15.1	66.5
2005	2.1	65.9	32.0	12.8	10.4	76.8
2011	1.5	74.8	23.7	8.4	10.3	81.3
on farms:						
- without commercial production	2.1	87.8	10.1	6.4	10.5	83.1
- with commercial production	0.8	81.0	18.2	5.0	14.9	80.1
with sales						
up to PLN 10 thousand	-	52.8	47.2	8.6	11.0	80.4
PLN 100 thousand and more	1.7	51.5	46.8	1.6	16.1	82.3

\* Covers persons aged 18-54.

Source: own elaboration on the basis of the IAFE-NRI survey 2011.

The IAFE-NRI research shows that among those declaring a willingness to take up non-agricultural economic activity as independent entities, the majority intended to pursue it on rural areas. However, their enthusiasm was dampened by difficulties that they would have to overcome when carrying out their intentions. The greatest concerns were raised by small demand in the segment of planned production (services). The most often declared problem was lack of organisational and legal knowledge, lack of capital and adequate professional and legal guidance, as well as inadequate infrastructural background. Whereas this concerned not

only insufficient level of the general technical infrastructure, but also lack of buildings where they could carry out the planned activity.

### Summary and conclusions

The paper analyses the demographic characteristics and level of education of the population working on individual farms in 2000-2011. Two groups were separated in each of the research periods, which was dictated by the criterion of working time and allocation of professional activity, in general providing a labour contribution to the used farm. The first group was composed of persons largely deciding on the total effects the conducted agricultural activity, i.e. permanently employed on a full-time basis on an individual farm, thus people treating their work as a profession. The second group was represented by a population which, given the amount and type of work performed on a farm, has a relatively small contribution to the production result (are redundant on the farm). Family farm was their only place of professional activity and this resulted, primarily, from the fact that they had no possibility to take up gainful employment.

On the basis of the conducted analysis it may be stated that the process of professionalization in the Polish agriculture progresses in the researched period. Despite some signs of aging of the persons working on individual farms the family labour force may still be considered relatively young. Whereas the process of aging was more pronounced in the population occasionally involved in agricultural activity. Relatively younger people more likely find jobs outside the family farms. This situation is due to the fact that employers are reluctant to hire older people (at the working age of non-mobility), not only because of their age and related factors, but also the lower level of qualifications.

A positive phenomena is, on the other hand, the gradual increase in the level of education of persons from both of the analysed groups working on individual farms, both the general and vocational education. The greatest increase was noted as regards higher education. In 2000-2011, the share of persons having such education in the population permanently working in agricultural activity on a full-time basis increased from 0.9 to 5.1%, while in the group working occasionally – from 2.9 to 8.9%.

From the perspective of work in agricultural activity what is important are agricultural qualifications of persons linking their professional activity to the used farm. In 2000-2011, the share of persons who graduated from agricultural schools in the above-mentioned population increased from 23.0 to 28.3%. At the same time, the overall changes resulted from a general increase in the prevalence of school qualifications in the population working on market-oriented farms with large area and scale of commercial production.

From the perspective of the possibilities of finding employment outside of agriculture, non-agricultural qualifications are the most important factor. This, however, refers not only to the current level of vocational education, but also to the general level of education which e.g. determines the possibility to obtain new skills compatible with the current labour market needs. In 2011, in the group of persons occasionally involving in works on farm and mobile from the perspective of the labour market, the share of persons with agricultural qualifications gained at school amounted to 74.8% of the population redundant from the point of view of conducted agricultural activity. These persons were related to relatively small entities.

On the basis of research results it may be considered that in the future the process of pro-effective reconstruction of the agricultural sector might be faster (especially through the implementation of agricultural progress) and its competitive capacities might improve also in the resources aspect. This statement is justified by the quality characteristics of the human capital linking, especially the level of education its professional activity with the used farm, as well as persons redundant in the agricultural activity. But the pace of these changes is

determined not only by the quality of human capital in agriculture but also by the externalities determining the processes of liquidation of a part of farms and diversification of economic activity of agricultural rural population. The intensity of labour flow from farming is mostly determined by the pace of economic development.

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- wiejskich, które wymagają wsparcia ze środków EFS. Modele instrumentów wsparcia reorientacji zawodowej rolników i członków ich rodzin ze środków EFS, expertise made at the request of the Department of Social Matters and Agricultural Education of the Ministry of Agriculture and Rural Development, IAFE-NRI, Warsaw.
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