

## **Current trend in human resources in the sector of agriculture in the Slovak Republic**

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### **Abstract**

Ageing of owners, managers and employers of agricultural enterprises is one of the biggest problems of agriculture. This causes problems of human capital reproduction in this sector. Despite the efforts of policy makers via various CAP reforms, like McSharry reform, Agenda 2000 and Fischler reform, this problem is not possible to alleviate or remove in short-term period. The aim of this paper is to point out the development of population ageing in the Slovak Republic and to specify possible negative trend in the oncoming period. In Slovakia, there was an increase of 30% of population older than 65 years during the last 30 years. During the same period, also the decline of the share of population younger than 15 years can be seen. The population between 15 and 65 years old was slightly increasing from 1996 until 2010. From 2010 onwards, this share is declining annually. There seems to be a relation between the given indicator and employment, as total employment increased about 12% during the last 5 years but employment in sector of agriculture decreased about 15% during the same period. Analysing of correlation between ageing of population and employment in the sector of agriculture and prognosis of future development of these indicators was another research objective of this paper.

**Key words:** ageing, population, agriculture, employment

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## Introduction

The Slovak Republic underwent transition to modern and democratic political system based on European values. This transition was a key driver to changes in almost all areas of life in the country, while national economy was among the most affected ones. Market oriented approach together with international competition reshaped the economy significantly. Each branch reacted to these new challenges differently. Nowadays, after more than a quarter of century, we have to admit that the state of agriculture turned out to be one of the key problem areas.

The share of agriculture on GDP was about 3.3% in 2014 compared to 7.12% in 1995 (Statistical Office of the Slovak Republic, 2016). These values are a clear statement that agriculture had undergone changes in the past years. Functions of agriculture changed when the country switched from food production paradigm to environmental and cultural paradigm. This approach of “post-production” paradigm had been set up by the old EU member states since 1980's and adopted by central European countries during the preparation for EU accession (Martinát and Klusáček, 2014).

Attractiveness of the sector combined with salary conditions are some of the crucial features influencing the employment in agriculture. According to the Statistical Office of the Slovak Republic (2016), average salary in the sector of agriculture was about 80% of the national average in 2014. In 1989, the situation was different. The average salary in agriculture was about 6% higher than the national average (Green Report, 2015).

These trends were considerably expressed mainly in rural areas. Loss of jobs in agriculture and the lack of other job opportunities led to higher unemployment rate (Martinát and Klusáček, 2014). Additionally, abandonment of agricultural land and depopulation of these areas led to substantial loss of production factors (Sorrentino et al., 2011).

This situation created a “distressing shortage of new farmers” due to certain economic and social factors (European Parliament, 2012). Furthermore, there is a growing gap between the group of young farmers under 35 years and elder farmers over 65 years in most EU countries. There are countries, however, where these problems are not so apparent, e.g. Austria and Poland. Research in this field proves that in all these countries farms are larger than average European farm size. There can be seen a direct relation between lack of young sole holders and higher number of small-scale farms (Zagata and Sutherland, 2015).

Growing group of elder farmers (older than 65 years) has been used as the subject of study in many academic studies. In fact, there are two main approaches to this phenomenon. On the one hand, some authors consider economic motives as the main reason for growth, e.g. poor pension planning and provision (Williams, 2006). On the other hand, there are academic findings showing social reasons why farmers relay to their jobs after reaching age above 65 years (Riley, 2016).

Average age and education level were identified as factors influencing openness to change (Baur et al., 2015). Study undertaken in seven selected European countries indicated significant differences in average age and educational level between the farmers and general population. When comparing average age, there was a difference of almost ten years between general population and farmers. Difference in education was also substantial. Farmers with 10.1 school years were 2.7 years behind general population.

Evidence from research oriented on regional data showed that there is a significant difference in young and elder farmers ratio.

### **Aim and methodology**

Aim of this paper is to indicate the current trends in ageing of population in the Slovak Republic in the context of employment in the sector of agriculture. The paper focuses on analysis of employment of particular age groups in the sector of agriculture. In order to clarify the trend in ageing of employees in the sector of agriculture, an analysis was done using the simple linear trend charts in two focus groups of young farmers up to 34 years and elder farmer older than 65 years. The Minitab software for statistical calculation was used to project the future development of these two groups.

Linear trend model can be explained in the form:

$$Y_t = \beta_0 + (\beta_1 * t) + e_t$$

Mean absolute percentage error (MAPE) expresses accuracy as a percentage of the error. The equation is:

$$\frac{\sum \left| (y_t - \hat{y}_t) / y_t \right|}{n} \times 100, (y_t \neq 0)$$

Mean absolute deviation (MAD) expresses accuracy in the same units as the data, which helps conceptualize the amount of error. Outliers have less of an effect on MAD than on Mean squared deviation (MSD).

$$\frac{\sum_{t=1}^n \left| y_t - \hat{y}_t \right|}{n}$$

The data used for the statistical calculations are: (1) RIAFE<sup>1</sup>'s Green Reports on Agriculture and Food Industry in the Slovak Republic (further as Green Report), (2) Agricultural statistics from Eurostat database. It is necessary to mention, that due to legislative changes on determining the farm size, the data on employment from Eurostat from 2008 onwards are different from the data provided by RIAFE.

From Green Reports we gained the following data:

- employment rate in agriculture in Slovakia 2000-2014,
- age structure of employees in Slovak agriculture 2000-2014, and
- education structure of employees in Slovak agriculture 2000-2014.

From EUROSTAT database we gained the following data:

- number of employees according to age and farm size in hectares 2005 - 2013.

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## Results

The demographic development in the EU countries follows, with some minor differences, a similar pattern. Ageing of population is a phenomenon that can be observed in all these countries. There was a decrease of younger population in Slovakia during the last 15 years. According to the Statistical Office of the Slovak Republic, the share of children up to 15 years decreased about 23.5% from 1999 until 2015. The share of labour force from 15 to 34 years old decreased by 12.5% during the same period. Other age groups, from 35 to 49 years, from 50 to 59 years and over 60 years, increased during the same period by 0.7%, 33.22% and 36.49%, respectively. Additionally, considering the age dependency ratio in Slovak conditions brings us to the same conclusions, as between the years 2000 and 2015 it dropped from 45% to 40.8% (WorldBank, 2016).

Such development has to be inevitably reflected in different aspects of national economy, while employment is one of the most affected spheres. Employment in the particular sectors seems to be differently responsive to the above-mentioned situation, but in agriculture it is rather obvious. The employment in agriculture has a decreasing tendency in the whole EU. Annual decrease of employment in European agriculture is around 5.8%. In Slovakia, the number of people employed in agriculture decreased by almost half between the years 1999 and 2014. Nowadays, the share of employment in agriculture in Slovakia is 3.28%. The average employment decreased from 4.3 workers per 100 ha of agricultural land to 2.1 workers per 100 ha. This, however, can be caused by several aspects, not just population ageing. Among others, the decline of the sector as such has to be mentioned (it can be proven by the decreasing share of agriculture on the national GDP). In addition, mechanisation of the sector played an important role together with sociological reasons as decreasing attractiveness of the occupation and discontinuation of relationship of a man towards land, which is a consequence of historical development. The ageing of labour force in this sector is one of the highest in the whole Slovakia. The decrease of younger labour force from 15 to 34 years and from 35 to 49 years was by 36.3% and 22.3%, respectively, during the last 15 years. The labour force from 50 to 59 years old increased by 59.7%. In relative terms, the share of employees older than 60 years increased by 428.6% during the last 15 years.

Based on the available data, we calculated possible forecast of development of labour force older than 65 years and younger than 35 years in the next six years. According to these calculations, the employment of workers older than 65 years will continue to increase and may reach more than 10% share. The age group of workers from 15 to 34 years old has a continuous rate. Also the forecast of future development of employment was estimated. During the last 14 years, the number of workers in this age group decreased by almost 9%. According to our calculations, it is possible that the number of workers will decrease by further 5% in the next 6 years. This supports our assumption that agriculture is one of the most affected areas of economy when discussing the problem of population ageing.

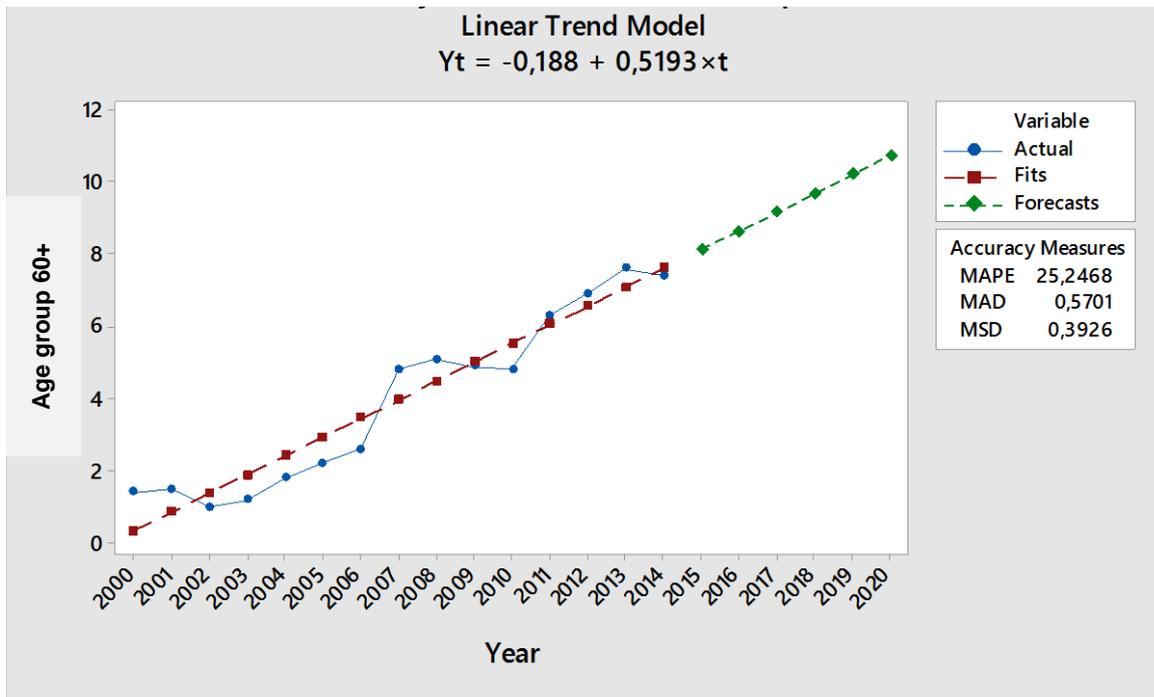


Fig. No. 1: Forecast of development of employees older than 65 years in agriculture  
 Source: own elaboration of data from the Green Reports 2000-2014

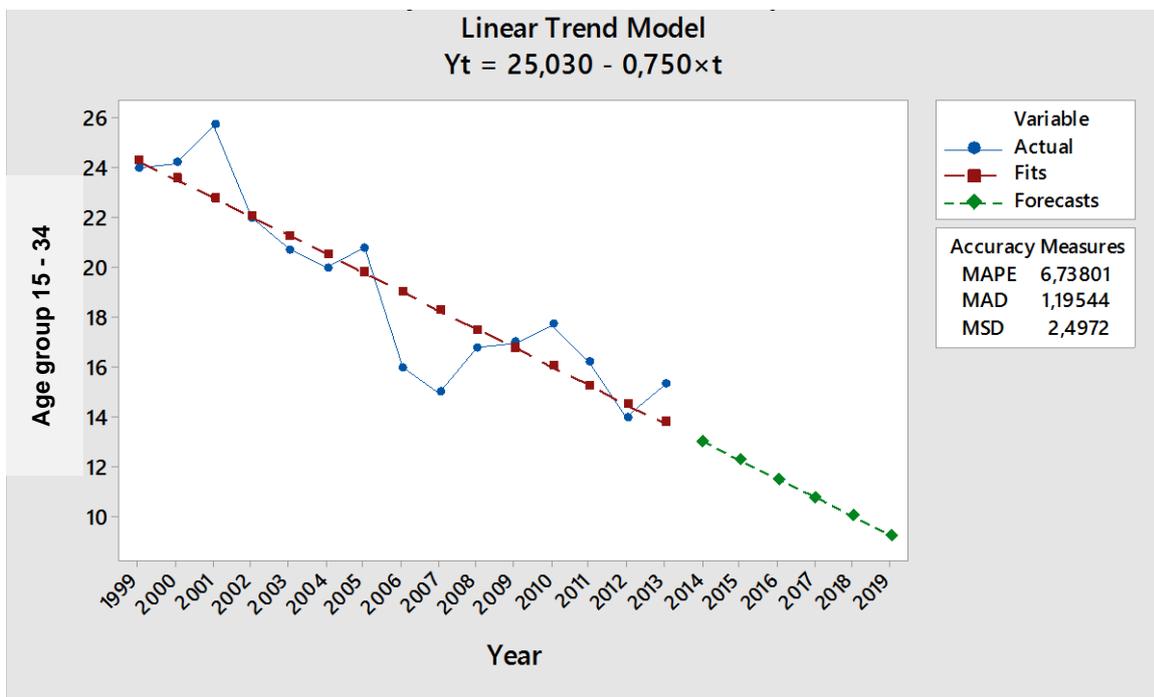


Fig. No. 2: Forecast of development of employees from 15 to 34 years old in agriculture  
 Source: own elaboration of data from the Green Reports 2000-2014

The link between employment in agriculture and on-going mechanisation of the sector, which was mentioned earlier, can be demonstrated on the relationship between employment and gross fixed capital formation (GFCF). With decreasing employment there is increasing

share of GFCF in agriculture. Total GFCF raised by 73.6% in 2013 compared to 1999. During the same period the GFCF in agriculture raised by 158.3%.

The level of education of employees is another indicator that changed during the last 15 years. The core workers usually gained secondary or higher secondary education. This group is relatively stable throughout the whole period with small rise by 6.5%. The main change can be seen in the share of employees with elementary and university education. The first group decreased by 11.7% while the other increased by almost 6%. This change can be explained by the changes in markets as well as increased necessity of certain knowledge and skills in this sector.

Based on the Green Reports from 2000 to 2015, the share of agriculture on macroeconomic indicators is decreasing. This decrease is connected with stagnation and low agricultural production, both having unfavourable impact on economic development of this sector. The positive effect in this sector is increasing investments in agriculture, which helped to stabilize or increase the GFCF. Usually, this trend was more significant at the beginning of different programming periods, since most of these investments were realized from the Rural Development Programme funds. During the last period, there seems to be a stabilization of employment in agriculture or lower reduction of labour force, but on the other hand, there is still a large gap between salary in agriculture and other economic sectors.

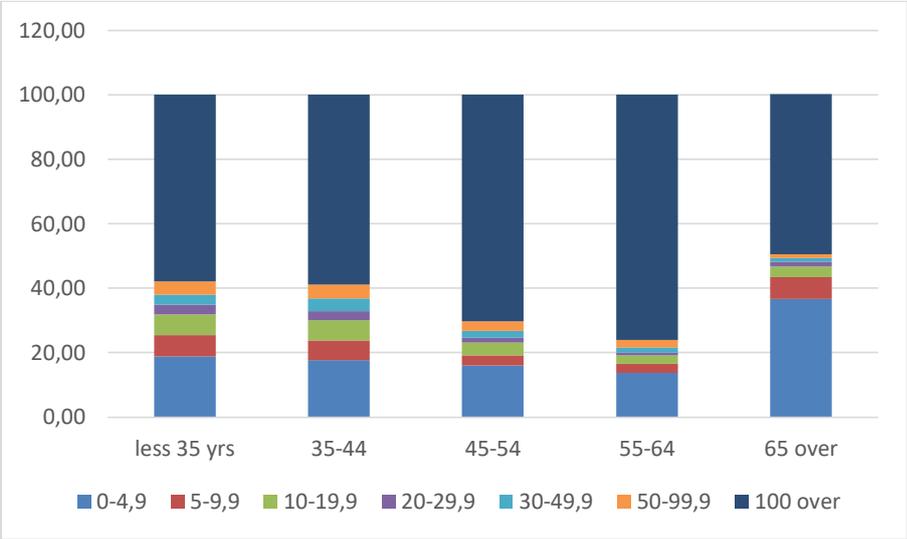


Fig. No. 3: Employment share (axis Y) according to the size of the holding and age of the labour force (axis X) in 2005

Source: own processing of data from Eurostat, 2016

According to the data from Eurostat it can be seen that the share of labour force in agriculture older than 65 years was significantly higher in small holdings with area less than 5 hectares in 2005. This supports the already mentioned research that showed higher concentration of elder labour force on smaller farms. When comparing the small and large holdings, the share of labour force is similar in all age groups up to 64 years.

After eight years, radical changes between employment in small and large holdings can be observed. The employment of age groups up to 64 years increased from 12.5 to 24.8% in small holdings. The highest decrease occurred in the age group of farmers older than 65

years where the employment decreased by 47.8%. The shift of employment moved from small holdings to large holdings where the employment rose from 5.87% to 39.7% for the age groups from 45 to 54 years old and over 65 years old respectively. Shift from the small-scale farms to large-scale farms can also be seen in other age groups. The changes of employment in age group of farmers older than 65 years can be seen in the following figure.

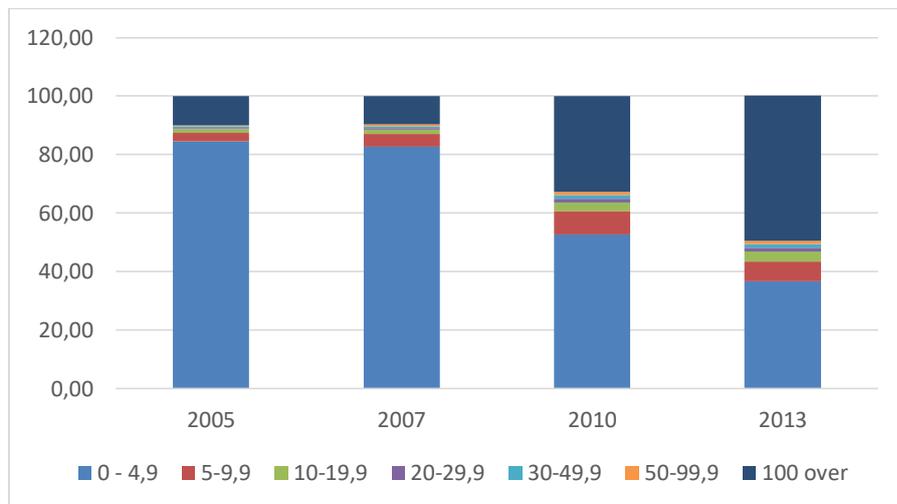


Fig. No. 4: Development of labour force (axis Y in %) older than 65 years according to the size of holding from 2005 – 2013

Source: own processing of data from Eurostat, 2016

## Conclusions

The results presented in this paper show that the trend of ageing is common in majority of the EU member states. According to the conducted analysis, sector of agriculture has a similar demographic development as global development in Slovakia. The employment in agriculture has a decreasing tendency throughout the whole period since 1999, but the share of employees older than 60 years has increased by over 400% while the share of employees younger than 35 years has decreased. The highest share of elder workers is mainly in small-scale holdings up to 5 hectares.

Although the employment is decreasing, the gross fixed capital formation is increasing. These investments are typical for large-scale farms, where the highest share of employees is from age groups between 15 to 49 years old.

The level of education is also linked to previously described changes. There was a rise of employees who reached secondary and tertiary education in the sector of agriculture. These changes are connected to new market oriented management procedures as well as increasing amount of gross fixed capital formation.

## Acknowledgement

Results of the paper are based on the research tasks of KEGA project No. 025SPU-4/2015 „Agricultural and Environmental Policy of the EU (University book and e-learning system in English).

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