

## HUMAN CAPITAL IN THE POLISH AGRICULTURAL SECTOR POST ACCESSION TO THE EUROPEAN UNION

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### **Abstract:**

In general, knowledge and information resources play a very important role in successful competition on local, regional, domestic and international markets. This has also been relevant to the Polish agricultural sector post accession to the European Union, as it has been confronted with the highly developed agricultural sectors of many other member states. Human capital is not only a source of innovativeness, but it is also an important factor for all transformations. As far as agriculture is concerned, human capital has become important for the improvement of management results, especially those corresponding to aspects of the management and organization of production factors: i.e. land and capital. It should also be noted that there is a relationship in agriculture between the quality of human capital, as determined by features of the farm manager, and the implementation of new developments. For a better educated farmer it is easier to implement innovation at his farm, with respect to investment in biological and technical material as well as changes in the organizational and technological spheres. This paper identifies and examines both the resources and selected features of human capital in Polish agriculture in the context of its competitiveness. An analysis is presented of employment levels in the rural economy, farmers' education levels, their experience and professional knowledge and access to information. Data sources include the Central Statistical Office and questionnaires carried out among farm managers in the Lublin region.

*Keywords: human capital, knowledge, agriculture, Poland*

## 1. INTRODUCTION

It is believed that knowledge and information resources play a very important role in an effective competition on local, regional, national as well as international markets (Porter, 2003, p. 32). Functioning in current economic reality requires higher support on mentioned factors than on natural resources or physical outlays (Powel & Snellman, 2004, p. 201). Intangible resources of the enterprise are perceived as the sources of competitive advantage (Kołoszko-Chomentowska, 2008, p. 79). This also concerns the agriculture, which after Poland accession to the European Union was confronted with high-developed agriculture of many member countries. This means the necessity of an adjustment to the requirements resulting from Common Agriculture Policy and meeting the competition on the Union market. Knowledge significance in an agricultural activity results from the fact that it becomes a motor drive of the new economy and a source of stable competitive advantages (Terluin & Post, 2000, p. 20).

The significance of human factor and features like education level or suitable knowledge resources is determined first of all by its role in management process. It is the carrier of innovativeness, and thus all transformations (Kołodziejczyk, 2002, p. 41-42). An increase in human factor significance in management appeared as a result of technique and technology development, IT, the need of competitive managing and economy globalization (Narski, 2001, p. 321). In case of agriculture, human capital is significant in managing results improvement, especially in an aspect of suitable managing and organization of other production factors, i.e. land and capital (Górecki, 2004, p. 187). Due to increase in surrounding complexity the agricultural producers function in, both quantitative and qualitative features should be taken into account in human capital assessment in agriculture. Lack of suitable qualifications and insufficient access to information decrease the chance of aimed target achieving. The results of the study of Gołębiewska and Klepacki (2005, pp. 461-462) point that there is a positive correlation between holding manager education level and obtained economic results as well as investment outlays born. Also Djomo and Sicod (2012, pp. 149-159) prove in their study that an experience and education level of the manager positively affect an efficiency of production factors in agricultural holding.

Also, the relationship between human capital quality determined using the features of the person managing the holding and progress implementation is visible in the agriculture. Better educated farmer demonstrates higher disposition for changes and innovations introduction on the farm. This especially concerns the investments in biological, technical material, changes in organizational and technological area (Sikorska, 2011, p. 50). Such conclusions were also drawn by Zajdel (2010, p. 185) who claims that low quality of human capital is a barrier impeding an introduction of modern production means and limiting agricultural holdings growth. From macroeconomic point of view, higher quality of human capital facilitates technological innovations, increases profits from capital and favors sustainable agriculture development (Penda, 2012, pp. 89-91). This was also pointed by Baptista (2012, pp. 105-109) who emphasized that modern technologies require an elaboration of new skills, changes in work schemes and relations on all organizational levels.

The premises mentioned above justify an undertaking of the study on human capital in agriculture. The aim of this research is an evaluation of resources and selected features of human capital in Polish agriculture in the context of its competitiveness. The analysis included the employment level in agricultural sector, farmers education, their experience and preparation for job performed, as well as an access to information. The data from the Main Statistical Office and the results of questionnaire survey conducted among agricultural holdings managers on an area of Lublin Voivodeship are the source material. The research was performed in the period of November - December 2013 on 319 agricultural holdings, which were selected randomly.

## 2. HUMAN CAPITAL IN POLISH AGRICULTURE

Poland is the country where agriculture affects macroeconomic indices to a higher degree than in most of the European Union member countries. According to EUROSTAT data, the share of gross added value in total added value in 2012 was in Poland 2.63%, while on a level of 27 EU countries it was half of this value, and was on a level of 1.38%. A decrease in an agriculture impact on added value creation with an increase in social-economic development may be noticed concurrently. The role of agriculture in Polish economy is also proved by high land and labor resources. Agricultural areas in Poland constituted in 2011 8.4% of EU agricultural areas and occupied 60% of total country area.

Despite a decrease in Polish agriculture employment noted for many years (Nowak, 2009, p. 179), this sector engaged in 2011 20% of fully-employed in EU agriculture and over 14% of total number of employed in Polish economy. Such high labor resources in this sector of economy point on the one hand a considerable production potential, and on the other hand agriculture structural problems. They result in low work effectiveness in agricultural sector, which is proved by gross added value of agriculture per one person fully employed in this sector which is over 3-fold lower than an average in the EU and over 10-fold lower than in Denmark and Holland.

**Table 1:** Resources and work productivity in agriculture in Poland at the background of the EU in 2011

Specification	Number of employed in agriculture in thousands AWU*	Percentage of employed in agriculture	Employed per 100 ha of agricultural area	Work productivity in agriculture (gross added value /1 AWU) euro/person
Poland	2101.3	14.3%	14.2	4236.4
EU-27	10134.7	5.9%	5.7	15202.2
Poland (UE=100)	-	-	247.8	27.9

\*Annual Work Unit

Source: Own elaboration based on EUROSTAT data: <http://epp.eurostat.ec.europa.eu> [readout date: 19.02.2014].

Human factor evaluation should include not only quantitative aspect, but also is quality which may be determined using an education level. Table 2 presents the education structure of agricultural producers in Poland. Formal education of the farmers is accepted a measure of the skill of farm managing with complete awareness of this measure imperfection. The significance of this factors is special in market economy conditions. Better educated people not only more easily accept changing circumstances, but also exhibit higher willingness of new solutions searching and implementation (Kołoszko-Chomentowska, 2008, p. 79). As may be concluded from the Common Agricultural Census from the year 2010, slightly over 10% of the farmers have higher education, over ¼ has post-secondary and secondary vocational education, and 38.6% basic vocational one. Nearly 20% of farm managers did not complete even primary school. A distinct increase in manager education level may be seen concurrently with an increase in agricultural holding area. Over 39% of managing the holdings of an area over 100 ha had higher education.

**Table 2:** Level of general education of agricultural holdings managers in Poland in 2010 according to area groups (%).

Holdings according to agricultural land area groups	Holdings managers according to general education level				
	higher	"post-secondary and secondary vocational"	general secondary	basic vocational	"gymnasium, primary and uncompleted primary, without school education"
IN TOTAL	10.3%	25. %	6.1%	38.6%	19.6%
0 - 1 ha	11.3%	25.2%	7.7%	34.0%	21.8%
above 1 ha	10.1%	25.5%	5.6%	39.9%	19.0%
1 - 2	12.0%	26.5%	7.2%	36.2%	18.1%
2 - 3	10.7%	25.0%	6.7%	37.5%	20.1%
3 - 5	9.6%	24.0%	5.9%	39.2%	21.3%
5 - 10	8.5%	23.8%	5.0%	42.1%	20.6%
10 - 15	8.1%	24.8%	4.1%	44.3%	18.7%
15 - 20	8.1%	26.7%	3.9%	44.4%	17.0%
20 - 30	8.9%	29.4%	3.8%	43.9%	14.0%
30 - 50	10.9%	33.5%	4.0%	40.9%	10.6%
50 - 100	17.9%	36.4%	4.4%	34.4%	6.8%
100 ha and more	39.2%	35.2%	5.4%	17.5%	2.7%

Source: Own elaboration based on MSO data.

From the point of view of agricultural holding managing, agricultural education is a very significant issue, especially that it is very often a requisite of aid obtaining within the Common Agricultural Policy. In fact, nearly 59% of holding managers do not have this kind of education. This percentage decreases however with an increase in managed holding area. In case of holdings of an area above 30 ha of agricultural land, only ¼ of the farmers did not gain specialist education (Table 3).

**Table 3:** Managers of agricultural holdings in Poland according to agricultural education level and agricultural land area groups (%)

Holdings according to agricultural land area groups	Holdings managers according to agricultural education level					Holdings where manager does not have agricultural education
	higher	"post-secondary and secondary vocational"	general secondary	basic vocational	gymnasium, primary and uncompleted primary, without school education	
IN TOTAL	1.9%	0.2%	8.4%	10.8%	19.7%	58.9%
0 - 1 ha	1.0%	0.1%	3.8%	4.1%	13.4%	77.5%
above 1 ha	2.2%	0.2%	9.6%	12.7%	21.4%	53.9%
1 - 2	1.4%	0.2%	5.5%	5.4%	17.8%	69.7%
2 - 3	1.6%	0.2%	6.1%	6.8%	19.9%	65.4%
3 - 5	1.6%	0.2%	7.1%	9.2%	22.1%	59.6%
5 - 10	1.9%	0.2%	9.6%	15.0%	23.7%	49.5%
10 - 15	2.5%	0.3%	13.5%	21.6%	23.8%	38.2%
15 - 20	2.9%	0.4%	16.6%	24.2%	23.1%	32.7%
20 - 30	3.8%	0.4%	19.9%	26.0%	21.9%	28.0%
30 - 50	5.4%	0.4%	23.7%	25.2%	20.5%	24.8%
50 - 100	9.2%	0.5%	25.7%	21.4%	18.3%	25.0%
100 ha and more	25.2%	0.7%	24.7%	11.0%	14.4%	23.9%

Source: Own elaboration based on MSO data.

Except formal education, an experience which farmer gains during work and holding managing plays a significant role in case of agricultural production. It may be concluded from the data presented in Table 4, that the share of managers with seniority up to 10 years was less than 1/3, 32.5% managed the holding for 11-20 years, and slightly over 36% played the role of holding manager for 21 years or more. It may be noticed concurrently, that there is no significant differentiation in holding managing experience in particular agricultural holdings area groups.

**Table 4:** Managers of agricultural holdings in Poland according to experience and agricultural land area groups in 2010 (%).

Holdings according to agricultural land area groups	Percentage of managers according to the years of agricultural holding managing (%)				
	up to 1 year	2-5	6-10	11-20	21 years and more
IN TOTAL	2.1%	11.7%	17.3%	32.5%	36.3%
0 - 1 ha	3.3%	14.2%	17.4%	27.5%	37.7%
above 1 ha	1.7%	11.1%	17.3%	33.9%	36.0%
1 - 2	2.3%	12.6%	20.6%	32.1%	32.4%
2 - 3	1.9%	11.3%	19.5%	33.3%	33.9%
3 - 5	1.7%	10.8%	18.1%	34.3%	35.0%
5 - 10	1.5%	10.4%	15.9%	35.1%	37.2%
10 - 15	1.6%	10.9%	13.9%	34.2%	39.5%
15 - 20	1.4%	10.5%	13.4%	34.0%	40.6%
20 - 30	1.3%	10.1%	12.9%	34.6%	41.1%
30 - 50	1.0%	9.2%	13.1%	35.9%	40.8%
50 - 100	1.1%	9.2%	15.0%	35.9%	38.9%
100 ha and more	2.0%	10.4%	19.1%	36.2%	32.3%

Source: Own elaboration based on MSO data.

In order to conduct more precise evaluation of human capital quality in agriculture, the questionnaire survey was conducted among agricultural holdings managers on the area of Lublin Voivodeship. This is a region of agricultural character, where 38.3% of total employed in 2011 worked in agriculture. The share of this sector in gross added value creation was considerable higher than the national level, reaching 5.8%. This research, as mentioned in an introduction, was performed on a sample of 319 agricultural holdings.

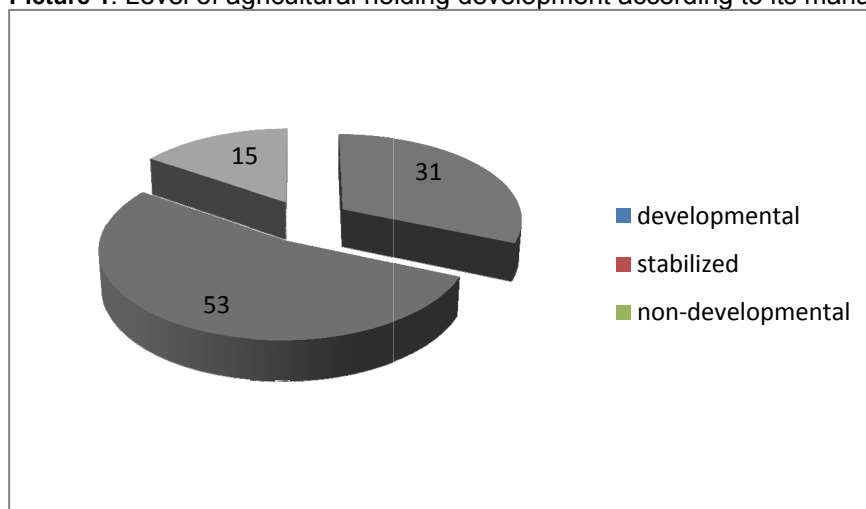
**Table 5:** Evaluation of preparation to farmer profession in an opinion of agricultural holdings managers (N=319)

Percentage of the answers according to evaluation					
very low	low	average	high	very high	hard to say
2.2%	5.3%	40.8%	33.9%	11.6%	6.3%

Source: Own elaboration based on questionnaire survey.

The managers of the examined holdings evaluated their own preparation to farmer profession. It is surprising that slightly over 40% declared that the level of their preparation is average, and nearly 8% low or very low. The attention should be however paid to the fact, that among the examined holdings, on average 67% of production was aimed at market, and nearly 10% of the holdings were non-commodity holdings, operating within self-supply system. Moreover, 15% of the examined evaluated their holding as non-developmental (Pic. 1). Additionally, 47% of holding managers did not have formal agricultural education, and nearly 20% of the rest, who had such education, completed only an agricultural course.

**Picture 1:** Level of agricultural holding development according to its manager opinion (%)



Source: Own elaboration based on questionnaire survey.

Insufficient degree of preparation for agricultural holding managing presumably results in part from a lack of knowledge updating. Almost 39% of the managers included in the survey did not participate in any trainings or courses over the last 10 years, while 44% never applied for the aid to Agricultural Consultative Center or any other consultative institution. In the circumstances of Poland accession to the European Union structures, increasing international competitiveness and globalization, the farmer without suitable knowledge and skills would not be able to manage on the changing market. Among the trainings where 61.1% of farmers participated in, the most common was chemization course, trainings concerning production specialization and ones related to the EU aid funds obtaining.

**Table 6:** Information which are not possessed or possessed in a limited degree by holding manager (number according to answers significance)

Kind of information	Number of answers*				
	1 position	2 position	3 position	4 position	5 position
concerning Common Agricultural Policy (direct subsidies, EU funds, etc.)	40	24	5	3	1
requirements concerning agricultural products quality	27	27	7	5	1
biological progress in agriculture	30	24	10	7	2
technical progress in agriculture	15	18	8	11	4
production means prices	16	17	3	6	15
agricultural products prices	14	19	9	6	4
agricultural products sales possibility	18	22	8	5	10

\* a few answers pointing possibility

Source: Own elaboration based on questionnaire survey.

Agricultural holding manager, like manager of any other enterprise, should possess suitable information in order to be able to react on market changes and suitably manage their unit. In fact, 30.1% of the respondents admitted they do not have a suitable set of information necessary in agricultural holding managing. Table 6 presents kinds of information which are not possessed by the manager or are possessed in a limited degree, according to their ranking accepted by the examined managers. The information concerning Common Agricultural Policy, biological progress and requirements concerning agricultural products quality were accepted as the most important information which are not possessed or are possessed in a limited degree by holding managers. Over 60 of the answers concerned also the possibility of agricultural products sales.

### 3. CONCLUSIONS

According to OECD definition, human capital means: “knowledge, skills, competences and features embodied in person, enabling creation of individual, social and economic welfare” (The Well-being of Nations, 2001). Particular elements of human capital (health, education, experiences, skills, etc.) are formed by various kinds of activities undertaken both by individual itself, and public institutions and policies. Therefore, an improvement in human capital quality in agriculture requires undertaking of complex activities from the side of education system, government and local authorities, as well as agricultural producers themselves. The need of agricultural sector supporting in this range also results from the fact, that Polish agriculture after an accession to the European Union structures was placed in new conditions formed by Common Agricultural Policy, international market and globalization processes. Numerous holdings were not able to manage with the competitiveness of highly-developed agriculture of western Europe, which resulted inter alia from a lack of knowledge and skills. Functioning on the Union market requires not only the knowledge concerning agricultural production but also the skills of adaptation to the changes observed on market and undertaking activities enabling competition on the Union market. It seems that also the system of agricultural consultancy in Poland requires some reformation, so that it would play a considerable higher role in the process of agriculture restructuring and modernization.

A significant challenge for Polish agriculture is also an outflow of working force excess from this sector to other economy branches. This is difficult due to an unprofitable situation on work market. An improvement of situation in this range is however favored by the concept of multi-functional development of rural areas. It assumes an economic activation of rural areas and additional functions taking by them, and thus clear acceleration of social-economic development rate.

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