



The organic farming in Poland compared to selected countries of the European Union versus sustainable development

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Abstract: Organic farming is based on care for the proper functioning of ecosystems, organisms with the simultaneous production of wholesome food raw materials. It fits into the concept of sustainable development by implementing the aspects: economic, social and environmental. Theoretical and empirical considerations concern the years 2006-2016 and are based on specialist literature and Eurostat data. The aim of the study was to determine the state of organic farming in Poland against the background of selected EU countries (Denmark, Germany, Spain, France, Italy, Sweden, Portugal, Greece). Based on the investigation, we can see that organic farming has been developing dynamically in recent years on the global, European and Polish scales. There is a visible increase in the number of organic farms and the increase in the area of agricultural organic lands in the European Union. In the case of Poland, the importance of organic farming is growing and this process is often stronger than in other compared countries. On the basis of the conducted research it was shown that there are significant differences in the structure of organic agricultural land between chosen EU countries. In northern countries (Denmark, Sweden, Poland), arable land is predominant, while in the southern EU (Spain, Italy, Greece, Portugal), the share of permanent crops was much higher than in the other analysed countries.

Keywords: organic farming, economic development, sustainable development, the European Union

JEL codes: O13, Q01, Q15

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1. Introduction

The changes taking place and their impact on the environment result from the activity, awareness and behavior of human beings as the main perpetrators of negative changes. Shaping people's

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awareness of and care about a clean environment can bring great successes now and in the future. Both in the world and in Poland, we are dealing with an increase in consumption, production per person per unit of time and an increase in energy consumption. As a result of intensive human activity, there are many phenomena in the form of: global climate change, change of water chemistry in the atmosphere, destruction of the stratospheric ozone layer, increase in the radioactivity of substances carried in the atmosphere, water and surface of the earth, increase in the tropospheric ozone, and desertification of many areas of the globe (Manteuffel Szoegé, 2005: 77-78).

These disturbing phenomena have increasingly drawn social attention around the world. This contributed to the development and implementation of the concept of sustainable development. Fiedor (2012: 28) believes that the main reasons for implementing the sustainable development paradigm can be found in:

- criticism of the theory of growth and prosperity;
- criticizing trends in consumption, production and technological progress that create pressure on the environment;
- the willingness to define a new relationship between people and the environment, which should be based on mutual respect, that is change in the dominant system of values, which resulted in the creation of ecological economics as a combination of new trends in ethics, philosophy and economics;
- an attempt to integrate ecological, cultural-institutional, ethical-axiological, awareness, technological, scientific, economic and social aspects, as well as an integrated rather than a fragmented view of social development.

Agriculture has become a huge burden for the environment. Wrong application of mineral fertilizers and plant protection agents contributes to the extinction of many species of flora and fauna and causes greenhouse gas emissions (Rogall cited by Golinowska 2013: 9). An alternative to intensive agricultural production has become organic farming.

The aim of the study was to determine the state of organic farming in Poland against the background of selected EU countries (Denmark, Germany, Spain, France, Italy, Sweden, Portugal, Greece). The selection of countries for analysis resulted from their different geographical location and the different state of economies compared to Poland. The southern part of the EU was thus represented by Greece, Italy, Spain and Portugal. Western countries were

France and Germany, and the northern countries of the EU were Denmark and Sweden. During the investigation the following were analyzed: the number of organic farms, their area, type of crops, and dynamics of the changes taking place in these sector. The study is an example of desk research, because the data were secondary. The sources of data were professional literature and public statistical base of EUROSTAT dealing with organic farming. The results were obtained by using descriptive and comparative methods. The article also uses the method of linear function to determine the forecast of organic farming development in the next few years. The results of investigation are presented in the descriptive, tabular and graphic forms.

2. The importance and essence of organic farming in the context of sustainable development

Agriculture now is, and in the future will be, playing one of the main functions in the global economy. Due to the surplus of agricultural products and threats to the environment, we should rather move away from the maximization of production towards environmental functions. The environment function is closely related to the natural resources, maintaining ecosystems, creating a landscape and spatial order. The search for a new model of people friendly managing and non-threatening to the surrounding nature poses many new challenges (Adamska, 2015: 87). Agriculture is undergoing a process of change towards taking up the goals of economic, social and environmental nature (Jończyk, 2014: 130). Organic farming makes it possible to combine these three types of goals. As Runowski writes (2009: 183), "ecological farming refers to the principles of sustainable development."

The issues of organic farming are discussed in many scientific studies. Individual authors display various aspects of it, which suggests that this is a matter of great importance (Mazur-Wierzbička, 2016: 195-206; Kociszewski, 2010: 11-22; Kociszewski, 2008: 203-211; Turczak, 2014: 59-70).

Organic farming is "an ecologically sustainable management system that limits human interference in the ecosystem, is largely independent of external inputs, and also allows the preservation and development of rural areas and agriculture as a social and cultural category, the goal of organic farming is to protect soils, water and landscaping, ensure biological self-regulation within the holding and maintain high biological quality of agricultural products"

(Kaczorowski and Baturó et al., 2004, cited in Kułyk and Michałowska, 2016: 18). The lack of use of processed mineral fertilizers, pesticides, growth regulators and synthetic feed additives determines that it is the most environmentally friendly system. Therefore, organic farming is very restrictive in relation to environmental protection (Runowski, 2009: 183).

According to Krasowicz (2005, cited in Golinowska, 2013: 11), in organic farming, production does not change the natural environment or affects it on a small scale, and this eliminates environmental degradation. Its essence should be seen in a holistic approach to management, sustainability, respect for nature, recognition of ethical values, application of characteristic principles in organic farming (Stolze and Lampkin, 2009, cited in Golinowska, 2013: 13).

The principles of sustainable development are propagated in many areas of social and economic life. Sustainable development means a new orientation of development on the global, regional and local scales (Uglis and Jęczmyk, 2015: 57). The concept of sustainable development should allow people to understand and respect relations between the environment, economy and society (Dacko and Płonka, 2017: 38). Organic farming is based on care for the proper functioning of ecosystems and organisms, with the simultaneous production of wholesome food raw materials. It fits into the concept of sustainable development by implementing the following aspects: economic, social and environmental. The concept of sustainable development is generally a paradigm of sustainability aimed at improving the quality of life of society, with simultaneous care for the environment and future generations. It is running a business in harmony with nature, acceptable ecologically, socially desirable and economically justified (Hopfer, 1992, cited in Fiedor and Kociszewski, 2010: 170). According to Zegar (2012: 21-22, cited in Kułyk and Michałowska, 2016: 19), organic farming limits the negative impact of production on natural capital, considers biological boundaries and helps to preserve resources for production in the future. From the economic and social points of view, it prevents excessive outflow of the rural population, helps to maintain jobs, is energy-efficient and is characterized by low support. Organic farming helps an increase in soil fertility, preserves biodiversity and its environmental burden is minimal (Łuczka-Bakuła, 2007, cited in Golinowska, 2013: 8). Using the principles of organic farming means a much lower level of chemization, and even its elimination from the process of cultivating agricultural crops and rearing livestock. This reduces the problem of

pollution by pesticides or excess mineral fertilizers, which is a big problem in conventional agriculture (Minta et al, 2013: 2889).

As reported by Barłowska et al. (2017: 3), in the face of diseases that are the result of consumed foods, consumers have reduced their trust in products produced by conventional methods in favour of organic food. Consumers through the purchase and consumption of organic products, improve their health and quality of life, and contribute to the development of organic farming. It is the growing consumer awareness and the association of farmers in producer groups that fosters the development of both organic production and organic processing (Kutkowska and Antosz, 2012; Pawlewicz and Szamrowski, 2012; Zuba, 2011, cited in Kajdanek and Smoliński, 2016: 57). Domagalska and Buczkowska (2015: 370) believe that man has become aware of his position and influence for his further development and existence. It is therefore necessary to harmoniously co-operate with many factors affecting the shaping of the environment.

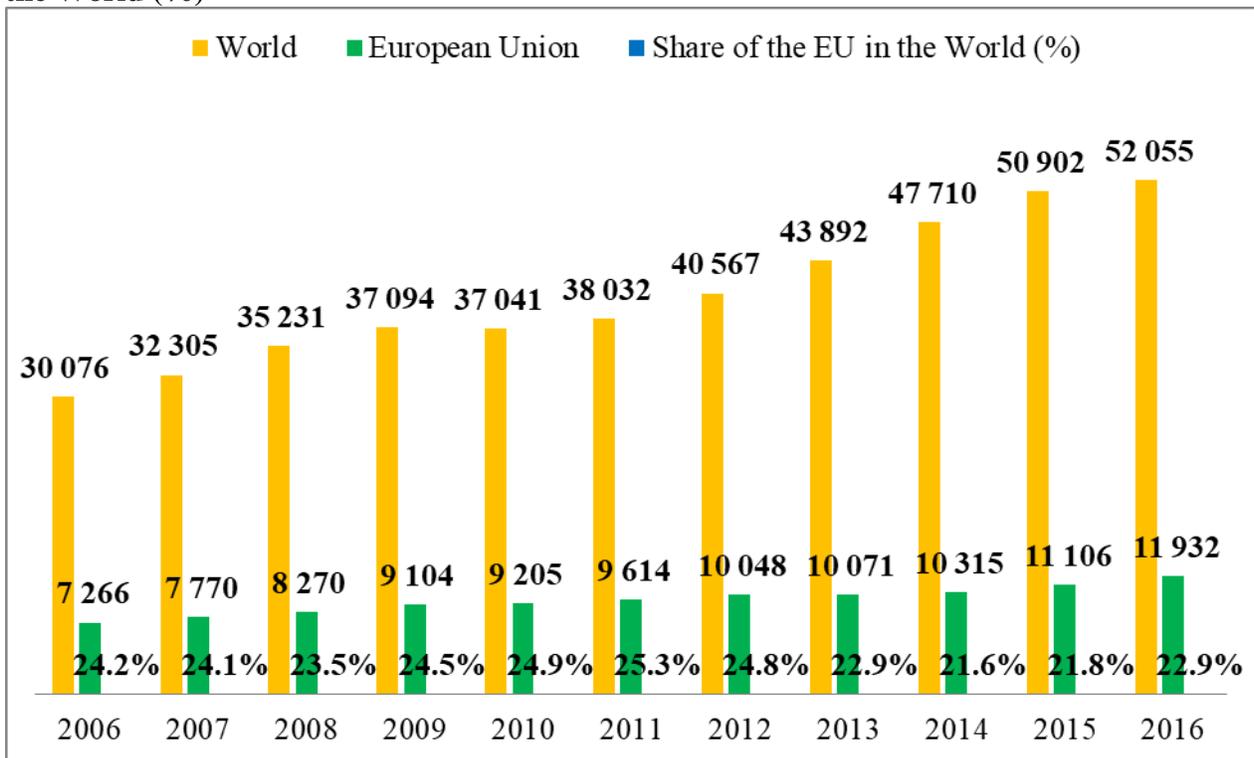
3. The organic farming in Poland and selected European Union countries

The introduction of the biodynamic method by Count Karłowski may be considered the beginning of ecological production in Poland (Duda-Krynicka and Jaskólecki, 2010, cited by Barłowska et al., 2017: 1). It is believed that the development of organic farming in Poland took place in stages. The first stage lasted until 1999, when there was no support for organic farming. The second stage covered the period from 2000 to 2004, in which the refinancing of farm attestations was introduced, and from 2001 on, small subsidies to the area of agricultural land. The third stage began in 2004 after Poland's accession to the structures of the European Union and it has continued until the present day. Meanwhile, the Common Agricultural Policy was introduced, which has resulted in the intensive development of organic farming (Kuś, 2009: 319). All in all, the visible development of the organic farming in Poland took place after 1999. The result of this phenomenon was state support in the form of subsidies and legal regulations concerning of agriculture and organic food (Kowalska, 2015:468).

On the global scale, there is progressing an increase in the area of organic farming. Dividing the world into continents, currently the leaders with the largest ecological surface are: Australia, Europe, South America. In turn, the largest increases in the organic farming are taking place in Africa and Asia. In the years 2006-2016, the area of ecological cultivation of the

European Union increased by over 60%. In 2006, it amounted to over 7 million ha, and in 2016 almost 12 million ha. However, regarding the scale of the whole World, the share of organic crops in the European Union has slightly decreased. Overall, during the period covered by the research, the European Union's share in the global organic farming area ranged between 21.6% - 25.3% (Figure 1).

Figure 1. Area (thousand ha) and share of the EU organic agricultural land in relation to the World (%)

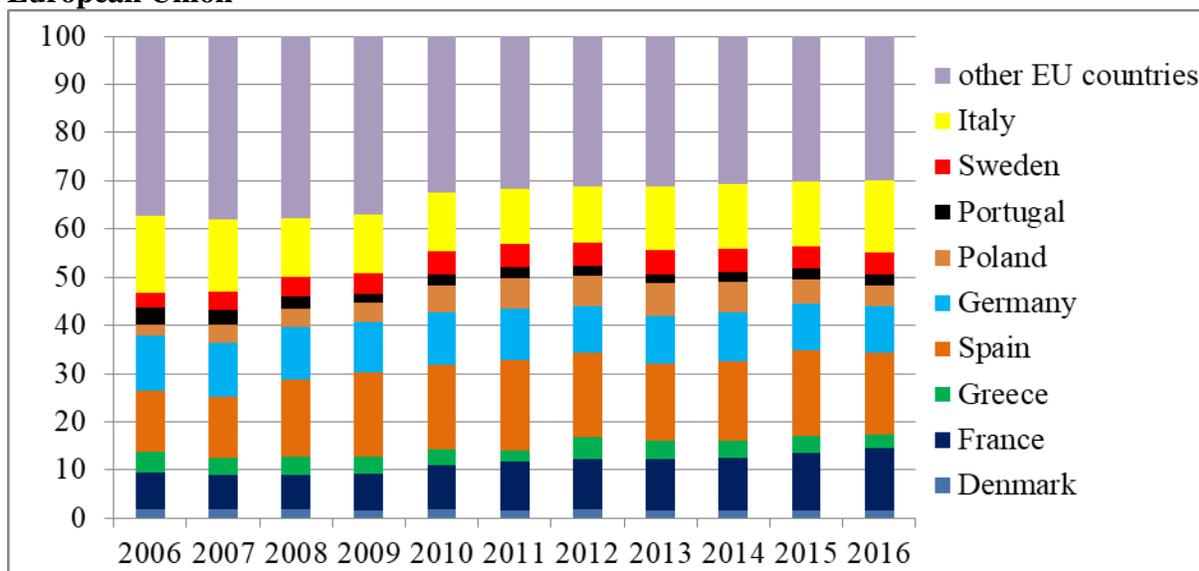


Source: Author's own elaboration based on: Eurostat, 2018.

The share of organic land in each country is different. In the analyzed countries (Denmark, Germany, Spain, France, Italy, Sweden, Poland, Portugal, Greece), it covers over 70% of the European Union's ecological area. In the years 2006-2016, the share of the organic area in these countries increased from 62.7% (2006) to 70.1% (2016), which means an increase of almost 8%. At the beginning of the analyzed period, Spain, Italy and Germany accounted for the largest share among the analyzed countries, i.e., over 10%. In Spain, the share of the organic area increased from around 13% (2006) to around 17% (2016). In Italy, since 2006, there has been a reduction in the share of ecological space, but in the last analyzed years a new increase was

observed. Also, a slight decrease in the share in the EU structure took place in Germany from 11.4% (2006) to 9.5% (2016). The countries where the share of the European Union's organic area is below 3% are Denmark, Portugal and Greece (2016) (Figure 2).

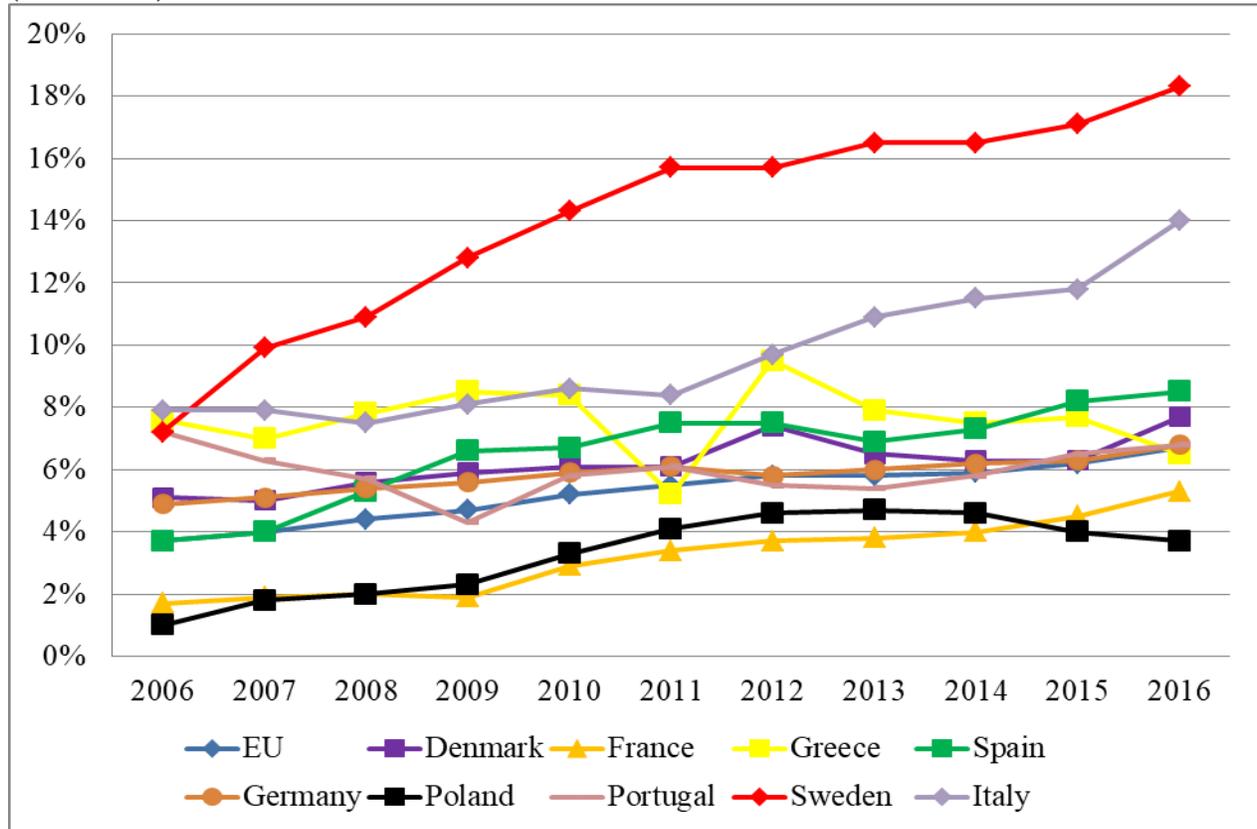
Figure 2. The share of countries in the total organic area used for agriculture in the European Union



Source: Author's own elaboration based on: Eurostat, 2018.

From the point of view of the ecological production, an important element is the share of organic farming in the total agricultural area of a given country. Among the analyzed countries, the largest share of organic areas has been in Sweden and Italy and it is still growing. In Sweden, the share of the organic farming land increased from 7.2% (2006) to 18.3% (2016), while in Italy the intensive increase in the share of organic area in the total agricultural land took place in 2012 and in 2016 amounted to 14%. In Poland and France, the share of the ecological agricultural land has been the lowest compared to the other analyzed countries, although it should be noted that in recent years it has increased very much.

Figure 3. The share of organic farming in the total agricultural land of a given country (2006-2016)



Source: Author’s own elaboration based on: Eurostat, 2018.

Analyzing the change in the usable land area in organic farming between 2006 and 2016, it can be seen that the largest areas of such lands were initially in Italy (1148 thousand ha), Spain (926 thousand ha) and Germany (826 thousand ha), whereas in 2016, Spain had the largest land area in organic farming (2019 thousand ha), followed by Italy (1796 thousand ha) and France (1537 thousand ha). In the case of Poland, there was a significant increase in this type of land from only 164 thousand ha in 2006 (then only Denmark had a smaller area of organic farming amounting to 138 thousand ha), up to 670 thousand ha in 2013. In the next years, the area of organic farming in Poland decreased slightly and in 2016 amounted to 534 thousand ha. Generally, in the European Union, the area of organic farming land grew from 7.3 million ha in 2006 to over 11.9 million ha in 2016 (Table 1).

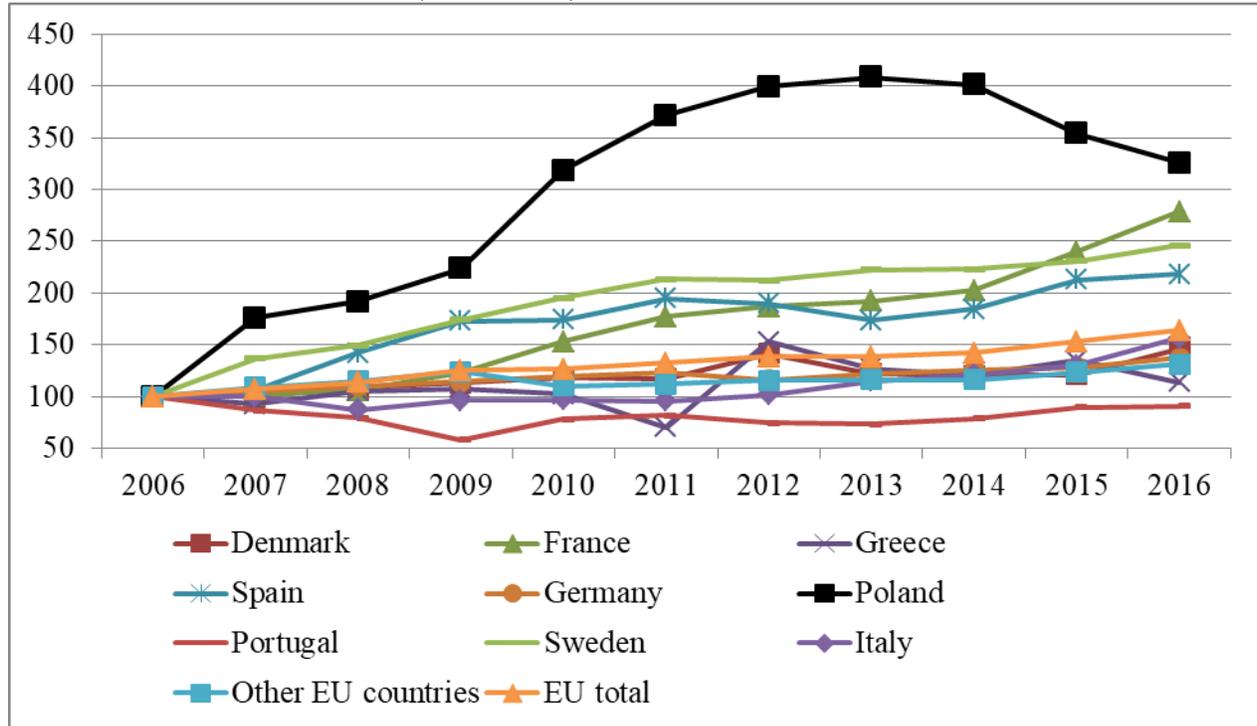
Table 1. Land area in organic farming in thousands of ha in European Union countries in 2006-2016

Country	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Denmark	138	138	150	156	163	162	195	169	166	167	202
France	552	557	584	678	845	977	1031	1061	1119	1323	1537
Greece	302	280	318	326	310	213	463	384	363	407	343
Spain	926	988	1318	1603	1615	1804	1756	1610	1710	1969	2019
Germany	826	865	908	947	991	1016	960	1009	1034	1060	1136
Poland	164	289	314	367	522	609	655	670	658	581	534
Portugal	269	233	214	157	211	220	201	197	212	241	245
Sweden	225	308	336	392	439	480	478	501	502	519	553
Italy	1148	1150	1002	1107	1114	1097	1167	1319	1388	1493	1796
Other EU countries	2714	2960	3125	3371	2995	3036	3142	3151	3163	3346	3567
EU total	7266	7770	8270	9104	9205	9614	10048	10071	10315	11106	11932

Source: Author's own elaboration based on: Eurostat, 2018.

In individual countries, changes in the area of organic farming took place with variable dynamics. The largest dynamics of the changes concerned Poland, where in 2016 there were almost 226% more areas used for organic farming than in 2006. France was on the second place. In this country, there is an increase of almost 180% of the land area in organic farming between 2006 and 2016. Among the countries covered by the analysis, only in Portugal did the area of organic farming land decrease by 8.9% in 2016 as compared to 2006. Overall, in the analyzed period in the European Union, the area of land in organic farming increased by about 64% (Figure 4).

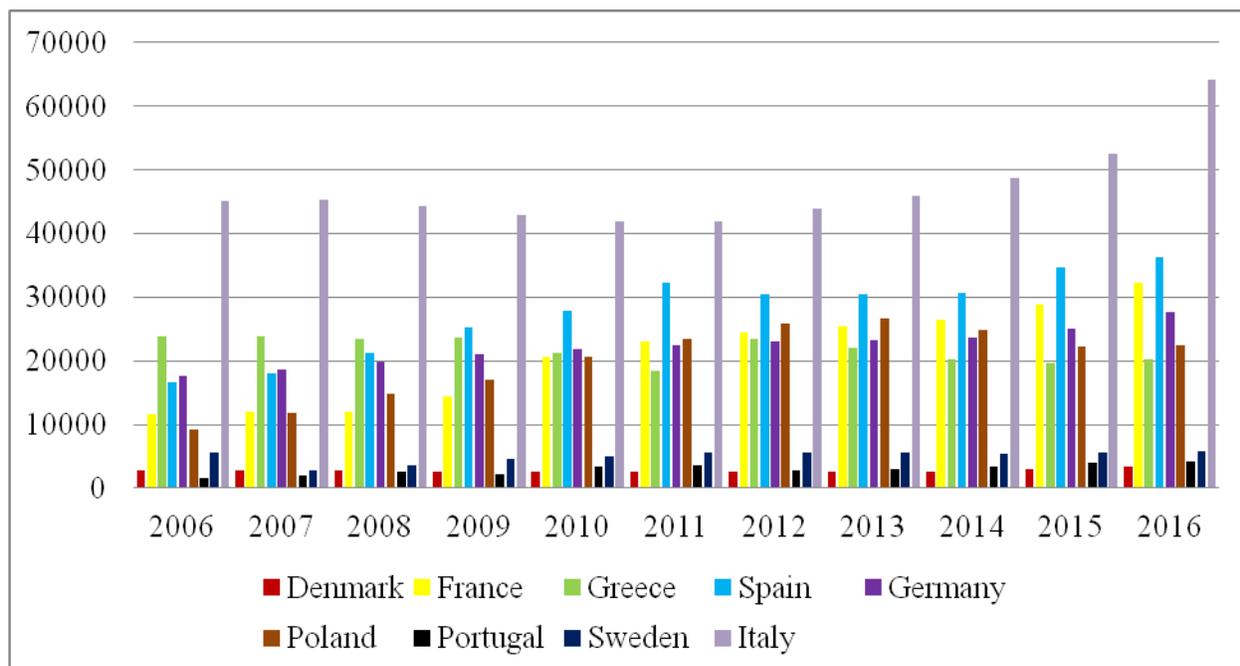
Figure 4. Dynamics of agricultural land changes in organic farming in selected European Union countries in 2006-2016 (2006 = 100)



Source: Author's own elaboration based on: Eurostat, 2018.

The development of organic production is evidenced not only by the growing area of organic farming, but also by the growing number of farms. More and more agricultural producers undertake production activities based on ecological principles. This interest may result from many economic and environmental considerations. According to Motowidlak (2008: 89), the increase in the number of organic farms also took place in earlier years, and by 2006 it had increased more than 34-fold in the EU Member States. The phenomenon of an increase in the number of organic farms also took place after 2006. In 2016, the largest numbers of organic farms were in Italy (64.2 thousand) and Spain (36.2 thousand), while the smallest numbers were in Sweden (5.7 thousand), Portugal (4.3 thousand) and Denmark (3.3 thousand). In comparison to the analyzed countries, Poland was in the middle of the rating. The number of Polish organic farms was over 22,000 in 2016, which gave it the fifth place among the surveyed group of countries (Figure 5).

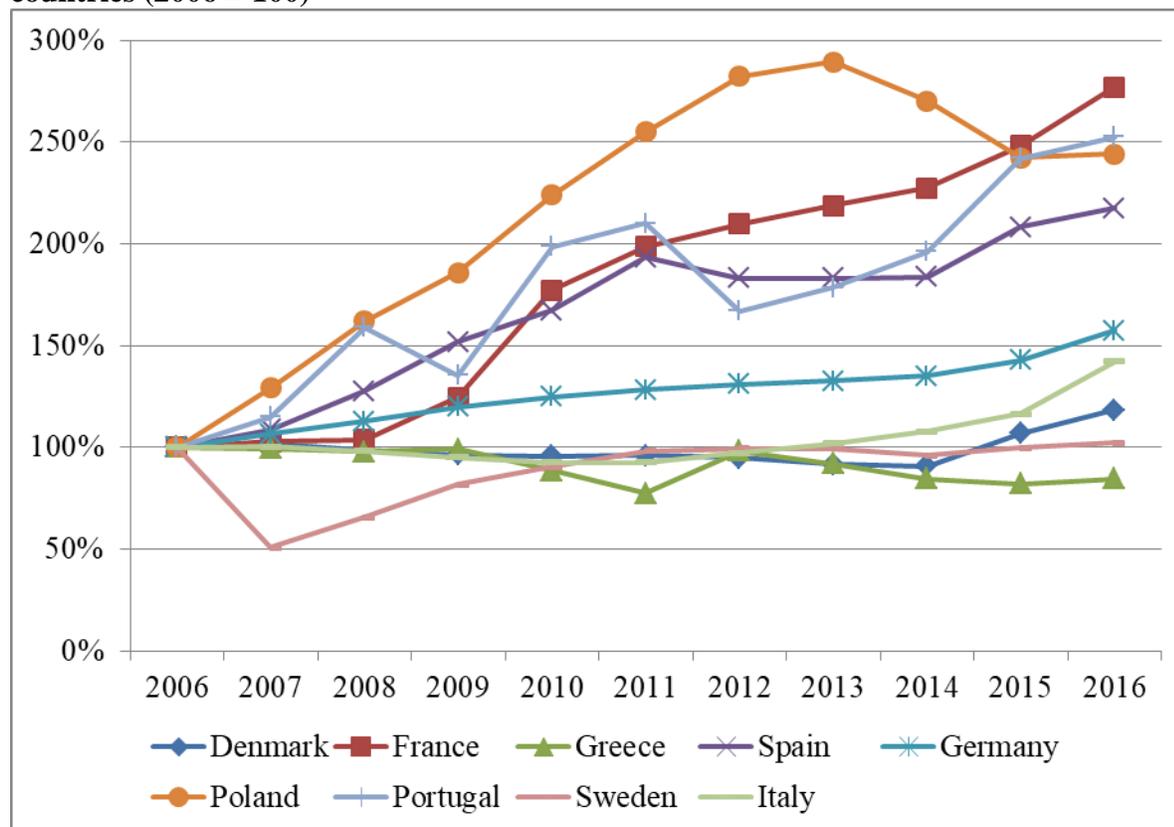
Figure 5. The number of organic farms in selected European Union countries (2006-2016)



Source: Author's own elaboration based on: Eurostat, 2018.

In the years 2006-2016, the change in the number of organic farms occurred with variable dynamics. The largest increases in the number of organic farms occurred in Poland and France (over 250%). In turn, the phenomenon of a decreasing number of organic farms concerned Greece (a decrease by about 15%). In the case of Sweden, a very large drop in the number of organic farms was visible in 2007, but since then the trend has been reversed and it was 2.1% more organic farms in 2016 than at the beginning of the analyzed period (Figure 6).

Figure 6. Dynamics of changes in the number of organic farms in selected European Union countries (2006 = 100)



Source: Author's own elaboration based on: Eurostat, 2018.

On the basis of data from the period 2006-2016, in the countries selected for the research, a trend analysis and a forecast of the number of organic farms for the years 2018 and 2022 were made. The strongest growth trends were in France, Spain and Poland. However, in the case of Greece, there was a downward trend (the regression equation is $y = -415.93x + 24290$). Assuming that in the following years the trends would not change, it was estimated that the number of organic farms in Poland should reach 30232 in 2018, and in 2022 it will reach the level of 36,125 (Table 2).

Table 2. Trends and forecast the number of organic farms in 2018 and 2022

Country	Regression equation	Coefficient of determination R ²	Forecast for 2018 year	Forecast for 2022 year
Denmark	$y = 19.964x + 2651.9$	0.0931	2911	2991
France	$y = 2178.7x + 7970.9$	0.9558	36294	46008
Greece	$y = -415.93x + 24290$	0.4938	18882	17219

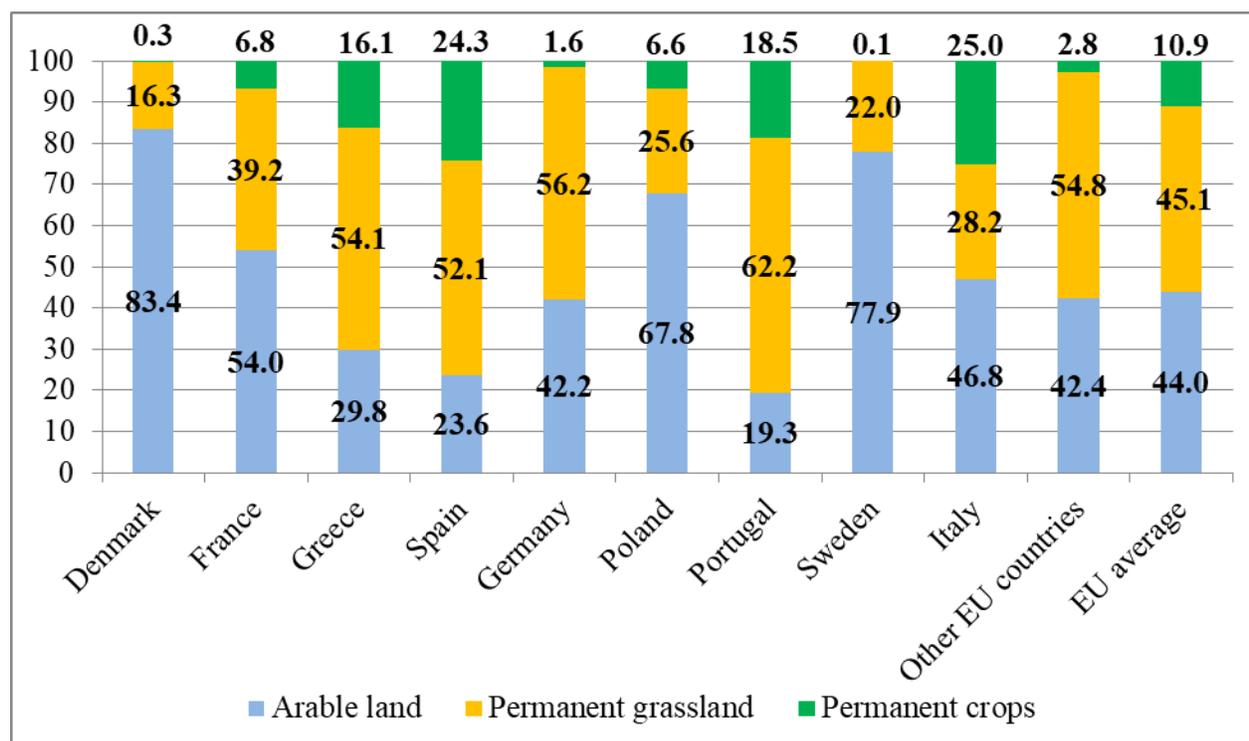
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Spain	$y = 1865.6x + 16424$	0.8965	40676	48139
Germany	$y = 846.77x + 17129$	0.9509	28137	31524
Poland	$y = 1473.1x + 11082$	0.6963	30232	36125
Portugal	$y = 211.71x + 1683.5$	0.7896	4565	5452
Sweden	$y = 175.06x + 3976.9$	0.3764	6252	6953
Italy	$y = 1328.1x + 38992$	0.4554	56257	61569

Source: Author's own elaboration based on: Eurostat, 2018.

When analyzing the 2016 data on the structure of agricultural land in organic farms in individual EU countries, differences are visible due to geographical location. Southern European countries, such as Greece, Spain, Portugal and Italy, have a larger permanent crops share than other countries (respectively 16.1%, 24.3%, 18.5% and 25.0%). On the other hand, countries located in the north, such as Denmark, Poland and Sweden, had a much higher proportion of arable land compared to other countries in the structure of utilized organic farming land (respectively 83.4%, 67.8% and 77.9%). The share of permanent grassland in organic farms varied depending on the country from 16.3% in Denmark to 62.2% in Portugal, but there cannot be seen a clear dividing line between north and south of Europe in this case (Figure 7).

Figure 7. Structure of agricultural land in organic farms in the EU countries in 2016



Source: Author's own elaboration based on: Eurostat, 2018.

The data for 2016 indicated that in the whole European Union, the permanent grassland was only 1.1% larger than the arable land (45.1% and 44.0%, respectively of the organic farming land). In the analyzed period, the proportion of permanent crops in this structure was on average 10.9% (Figure 7).

4. Conclusion

Organic farming has been developing rapidly in recent years, both on the global scale and those of Europe and Poland. In the period selected for the research, the increase in the number of organic farms and the increase in the area of agricultural arable lands in the European Union is generally visible. In the case of Poland, the importance of organic farming is growing and this tendency is often stronger than in other countries. This is confirmed by the results of the research, because the area of organic farming in the EU increased by over 64% (from 7266 thousand ha in 2006 to 11932 thousand ha in 2016). Among the compared countries, the largest increase in the number of organic farms was recorded in France, Poland, Portugal and Spain (increases in these countries were higher than 200% between 2006 and 2016). From all the countries selected for comparison only in Greece the number of organic farms decreased (a decrease by 15% over the period considered). Thanks to the linear function method, it was determined that the strong growth trend in the number of organic farms was in Poland (the linear function equation is $y = 1473.1x + 11082$) and if the conditions do not change, in 2022 the number of Polish organic farms will exceed 36 thousand. The rapid development of organic farming in Poland may be connected with the introduction of special financial incentives after entering the European Union for farmers who want to deal with agriculture in accordance with ecological requirements. Thanks to the conducted research, interesting differences in the structure of agricultural land used by organic farming were observed. These differences took place on the north-south line of the EU and consisted in the fact that in the southern countries there were much more than the average permanent crops (the average for the entire EU is 10.9%, e.g., in Spain it was 24.3%, Portugal 18.5%, Italy 25.0 %). In contrast, in northern EU countries (Denmark, Sweden, Poland), organic lands were primarily arable land (Denmark - 83.4%,

Sweden - 77.9%, Poland - 25.6%). In the case of the permanent grassland share, there was no such dependence resulting from the geographical location.

Organic farming as compared to conventional farming does not pose a burden to the natural environment and does not contribute to the intensification of negative climate change. Less production means are consumed here, and especially the use of environmentally harmful pesticides or large doses of mineral fertilizers is avoided. For this reason, the growing importance of organic farming, and thus the increase in the scale of production of agricultural raw materials of ecological character, should be perceived as a good signal that is consistent with the idea of sustainable development. On the other hand, in the perspective of an increase in the number of human populations on Earth and the need to fight the global scourge of hunger, one can ask where the safe borderline is for further growth of this sector in the future.

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Rolnictwo ekologiczne w Polsce na tle wybranych krajów Unii Europejskiej a rozwój zrównoważony

Streszczenie

Rolnictwo ekologiczne to gospodarowanie oparte na dbałości o prawidłowe funkcjonowanie ekosystemów i organizmów z jednoczesnym wytwarzaniem pełnowartościowych surowców spożywczych. Wpisuje się ono w koncepcję rozwoju zrównoważonego realizując aspekty: gospodarcze, społeczne i środowiskowe. Rozważania teoretyczne i empiryczne dotyczą lat 2006-2016 i bazują na specjalistycznej literaturze oraz danych Eurostatu. Celem opracowania było określenie stanu rolnictwa ekologicznego w Polsce na tle wybranych krajów Unii Europejskiej (Dania, Niemcy, Hiszpania, Francja, Włochy, Szwecja, Portugalia, Grecja). Na podstawie badań można zauważyć, że rolnictwo ekologiczne rozwija się dynamicznie w ostatnich latach w skali globalnej, europejskiej i polskiej. Widoczny jest wzrost liczby gospodarstw ekologicznych i wzrost powierzchni użytków rolnych w Unii Europejskiej. W przypadku Polski widoczny jest rozwój rolnictwa ekologicznego, a proces ten jest często silniejszy niż w innych porównywanych krajach. Na podstawie przeprowadzonych badań wykazano, że istnieją znaczne różnice w strukturze ekologicznych gruntów rolnych między wybranymi krajami UE. W krajach północnych (Dania, Szwecja, Polska) przeważały grunty orne, podczas gdy na południu UE (Hiszpania, Włochy, Grecja, Portugalia) udział upraw trwałych był znacznie wyższy niż w pozostałych analizowanych krajach.

Słowa kluczowe: rolnictwo ekologiczne, rozwój gospodarczy, rozwój zrównoważony, Unia Europejska.