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THE GREEN DEAL: TOWARDS ORGANIC FARMING OR GREENING OF AGRICULTURE?

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Abstract

The purpose of the research is to evaluate the socio-economic consequences of increasing the area of agricultural land under organic farming in Poland. Increasing the share of organic farms in agricultural land could lead to a reduced agricultural production, which would pose a threat to food security. Implementing the principles of an integrated and precise production system of a greater range comparing to organic farming could be a competitive solution that would contribute to achieving the environmental and climate protection objectives to a greater extent, while maintaining the existing production rate. The implementation of the objectives was based on a comparative method: the authors compareorganic farms in Poland and Germany with farms applying conventional agricultural production systems. The research results demonstrate that implementing the Green Deal assumptions related to reaching 25% of agricultural land under organic farming in Poland, while maintaining the existing trends, will lead to a drop in agricultural production by approximately 11%. A competitive solution is to allocate the CAP funds to support pro-environmental measures and programs in the case of all farms. Participation in such programs should be voluntary.

Keywords: farm, organic farm, European Green Deal, agricultural production systems.

JEL codes: Q10, Q12, Q14.

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Introduction

The statement that "social existence determines consciousness", which also involves the attitudes of society towards agriculture and food production, has actually become a cliché. In the post-war period marked by scarcity, poverty, and food shortages, the activities taken by the communities and policy-makers focused on maximizing agricultural production to satisfy food needs. These efforts were reflected by the Treaty of Rome of 1957 establishing the European Economic Community (EEC) and laid down the following objectives of the Common Agricultural Policy: to increase agricultural productivity by promoting technical progress and rational utilization of the production factors, to assure the availability of supplies that will reach consumers at reasonable prices, to stabilize markets, and to ensure a fair standard of living for the agricultural community (Treaty of Rome). The need for environmental protection has not been recognized yet. The prerequisite for meeting these objectives was the protection of the EEC's internal market. The tools applied led to differences between the global prices of agricultural products and prices within the EEC. The latter were significantly higher.

Within several years, the implementation of the adopted EEC objectives led to an overproduction of food and problems with managing surplus stocks of agricultural products, followed by discrepancies between the interests of EEC and non-EEC states. These were reflected in the GATT (future WTO) negotiations. The arrangements of the GATT Uruguay Round reduced the protectionism of the Community market and streamlined access of cheaper agricultural products from non-EEC markets to the Community market. This led to amendments of the Common Agricultural Policy introduced by the 1994 MacSharry's reform followed by Agenda 2000, assumptions of which were adopted in 1997. Some new objectives were added: the competitiveness of EU agriculture, creating the conditions to generate additional incomefrom non-agricultural industries for agricultural producers and their families, the inclusion of environmental objectives, and a greater involvement of farmers in managing natural resources. The latter objective addressed, to a certain extent, consumer expectations towards food quality, which had been increasing along with societies' wealth (Wąs et al., 2018).

To address the social expectations, the Common Agricultural Policy for 2021--2027 has introduced new objectives that supplement the existing ones: supporting farmers' income, enhancing market orientation and competitiveness by making use of scientific research, technology and digitization, and improving farmers' position in the value chain. The need to mitigate climate change, protect biodiversity, habitats, and landscape, was recognized to a greater extent. These assumptions were reflected in the "European Green Deal" strategy encompassing the following policy areas: "From Farm to Fork" and "Biodiversity", which refer directly to agriculture. The key components of these strategies include:

- increasing the share of agricultural land under organic farming up to 25% in the individual countries and in the whole EU by 2030,
- reducing the use of chemical plant protection products by 50%,
- reducing the use of industrial mineral fertilizers by 20%,
- reducing the use of veterinary medicinal products by 50%,
- increasing the share of total agricultural land including high-biodiversity[1] and non-productive landscape elements to 10% (European Green Deal, 2021; Wrzaszcz and Prandecki, 2020; Zygmunt, 2020).

Defining the objective, i.e. increasing the share of agricultural land under organic farming, raises no formal reservations. It is unambiguous, similar to increasing the share of high-biodiversity areas in total agricultural land. The meaning of the remaining objectives remains unclear, however. How to understand decreasing the use of chemical plant protection products by 50%, veterinary medicinal products by 50%, and mineral fertilizers by 20%? On an average basis throughout the EU or per individual countries? Differences in the use of these products between the individual EU Member States are significant. For example, in 2016, the Netherlands used 9.36 kg of active substance per 1 ha of agricultural land while the use in Poland amounted to 2.18 kg/ha (Statistics Poland, 2020) in the same year[2]. Similar differences are found in the use of mineral fertilizers and veterinary medicinal products. Reduced use of these products in the countries with a high consumption rate, e.g. above the EU's average, would be reasonable. On the other hand, Poland should increase their use to a reasonable level. These issues require a prudent decision. Assuming that one of the key objectives of the Green Deal is to protect climate and biodiversity, one should pose the question about the effectiveness of the measures, including primarily, increasing the share of organic farms up to 25% of agricultural land. This agricultural production system was previously supported by CAP payments, and its further support is planned even to a greater extent (Rozporządzenie MRiRW, projekt 2020). With regard to limited measures for CAP implementation, a question arises as to their optimal use in the context of climate and biodiversity protection. This leads to the following dilemmas: would increasing the support for organic farming at the expense of the other pro-environmental measures be reasonable and could better outcomes be achieved by more intensive support of other pro-ecological measures? The answer requires an evaluation of the socio-economic effects of increasing the share of land dedicated to organic farming to the target level of 25% of agricultural land.

[1] These include, among others, buffer zones, rotational and non-rotational areas, fallow lands, hedges, etc.

[2] Using average values on a national scale may lead to incorrect conclusions. There are differences in the use of chemical plant protection products and fertilization rates between farms of different sizes. In 2018, the total use of plant protection products on farms with an agricultural land area of more than 50 ha was by 24% higher compared with farms with an agricultural land area of 5-10 ha, while the difference in farms of analogical classes specializing in field crops amounted to 30%. The difference in mineral fertilization rates in the case of this type of farms between analogical classes was 47% (Bocian, Osuch, and Smolik, 2020).

Methods and materials

The main aim of the study is to evaluate the socio-economic effects of increasing the area of agricultural land under organic farming in Poland. Experience has shown that soil productivity in the case of organic farms was lower by approximately 50% compared with farms using conventional agricultural production systems[3] (Krupa, Witkowicz, and Jacyk, 2016). Increasing the share of organic farms in agricultural land would lead to reduced agricultural production, which in turn would pose a threat to food security in individual EU Member States. According to the estimates by M. Marciniak, increasing the area of agricultural land dedicated to organic farming up to 25% and the share of non-productive area up to 10% of agricultural land, cereal production in the EU may decrease by 70-80 million tons, i.e. by nearly 25% of their total production (Marciniak, 2020). Declined cereal production would unquestionably lead to an increase in their prices.

An additional aim is an attempt to determine whether the implementation of the environmental and climate protection objectives, primarily by increasing the agricultural land area used for organic farming/, is the only appropriate measure. Perhaps other agricultural production systems could be considered, such as integrated and precise farming[4], in which the implementation of the environmental objectives does not jeopardize the existing agricultural production rate (Majewski, 2002, 2008; Kuś and Stalenga, 2006). In addition, the environmental objectives may be achieved within the conventional system by implementing eco-schemes[5] and agri-environmental programs. It may be assumed that the implementation of the above-mentioned agricultural production systems outside organic farming will have a greater range than organic cultivation methods and will contribute to delivering the environmental and climate protection objectives to a greater extent, while maintaining the existing production rate.

In order to meet the aims, the study uses a comparative method. It presents the development of organic farms in the EU from 2005-2017. Selecting this period is associated with the integration of the Central and Eastern Europe countries (former socialist countries) with the EU. The countries were selected using the target

[3] The most common agricultural production systems are as follows: conventional farming – of various production intensity, poorly recognizing the issue of environmental protection and focused on the maximization of profit; organic farming – utilizing no synthetic plant protection products and industrial mineral fertilizers, focused on the use of the biological production potential of soil, flora and fauna, implementation of environmental objectives, and integrated farming consisting in management based on scientific recommendations, focused on equal implementation of environmental, economic, and social objectives. There is also the system of precise farming, in which the application of fertilizers and plant protection products are specified precisely on the basis of research and with the use of satellite technologies enabling the assessment of soil and plant condition (Wójcicki, 2008; Majewski, 1995, 2002, and 2008; Dominik, 2010)

[4] The integrated agriculture system allows for or even recommends using precise agriculture systems.

[5] Eco-schemes – a new direct payment under Pillar I. The eco-schemes will be an annual payment for implementing environmentally and climate friendly obligations/practices, which go beyond the baseline requirements and differ from the other obligations laid down in the Strategic Plan, i.e. among others, agri-environmental and climate obligations. The farmers will be able to join them on a voluntary basis, although each Member State must include a proposal of such an intervention in its strategic plan.

selection method with the following criteria: the level of economic and agricultural development of the countries and their geographic location. The first group includes the countries of the so-called old Union: Belgium, Denmark, Spain, France, Austria, the Netherlands, Germany, and Italy, while the second group included the Czech Republic, Slovakia, and Poland.

Organic farms from Poland and Germany compared with farms using conventional agricultural production systems were subject to detailed analyses. Making Germany the reference point resulted from similar production conditions and greater experience in organic farming. Research materials derive from the farms monitored by the Polish and German FADN. The organic farms were compared with conventional farms of the "mixed" type, as they are the most similar in terms of production structure. Data from the Polish organic farms were collected for the following years: 2010, 2015, and 2018. The group of these farms fell within the range between 240 and 311. This was disproportionately low compared with conventional farms and did not exceed 9%. It cannot be perceived as representative for all organic farms. However, it enables us to identify the existing trends. Similar proportions are found in the case of German farms. The paper presents the economic consequences ofachieving the 25% of organic farming target.

Development of organic farms in the European Union to date

Relevant figures specifying the share of organic farms in total farms and land use from 2005-2017 are presented in Table 1

Table 1

Role of organic farms in the selected EU Member States in 2005 and 2017 (%)

Country	2005				2017			
	Share in the number of farms	Share in agricultural land	Farm area (ha)		Share in the number of farms[a]	Share in agricultural land	Farm area (ha)	
			Total	Organic farms			Total	Organic farms
Belgium	1.40	1.71	26.9	32.91	5.70	6.16	36.70	39.66
Denmark	5.87	4.95	52.37	44.17	10.36	8.65	74.49	62.26
Spain	1.45	2.50	23.02	39.68	3.99	8.96	24.58	55.21
France	2.01	1.99	48.12	48.28	8.04	6.27	60.93	47.55
Austria	11.90	14.67	19.14	23.59	18.86	23.25	20.15	24.83
Netherlands	1.70	2.49	23.93	32.24	3.08	3.12	32.60	33.13
Germany	4.36	4.74	43.69	47.44	10.78	8.21	60.54	46.13
Italy	2.58	8.39	7.35	23.85	5.82	15.15	10.99	28.58
Czech Republic	1.96	7.16	84.10	307.61	8.58	15.05	130.39	98.57
Slovakia	0.28	4.80	27.43	460.20	1.71	10.00	73.53	430.75
Poland	0.29	1.08	5.96	22.23	1.43	3.43	10.21	24.42
EU 27/28	1.13	3.62	11.87	38.12	2.92	7.39	16.56	41.97

[a] share in the total number of farms refers to 2016

Source: Statistisches Jahrbuch über Ernährung Landwirtschafts und Forsten 2010 and 2019, Landwirtschaftsverlag, Münster.

In the vast majority of the countries listed above, the average area of organic farms is higher than the average area of farms in total. According to the presented figures, organic farming is a niche activity in most EU Member States. The share of organic farms in land use was lower than 10%. The only exceptions are Austria and Italy with shares of 23 and 15%, respectively, followed by the Czech Republic and Slovakia with shares of 15 and 10%, respectively. The statement that the Austrian and Italian farms are fully organic is entirely justified. These are family farms involved in direct sales. In addition, most Austrian organic farms are simultaneously agrotourism farms, while organic farms in the Czech Republic and Slovakia operate mainly as agricultural cooperatives and limited liability companies focused primarily on large-scale plant production. Organic farms in Slovakia are located in the sub-mountainous and mountainous regions where permanent grasslands prevail, although there is a low density of livestock (Pupel at al., 2018).

A specific feature of organic farms is a significant share of permanent grasslands in agricultural land. In 2015, their share in the EU accounted for 58.4% and 65.5% globally (Kwasek (edit.), 2018).

A question arises as to the role of organic products in food production. Unfortunately, data from individual countries and the whole EU are insufficient and incomplete. According to available information, the share of organic products in the food balance sheet in Austria in total accounted for 8.9% in 2018 and was by 14.6 pp. lower than the share of organic farming area in agricultural land. In Germany, the share of organic products in food balance sheet amounted to 5.3% in the same year and was by 2.91 pp. lower than the share of organic farms in the agricultural land area, i.e. 8.21% in 2017. This means that soil productivity on organic farms was lower than that of farms in total (Schaack, 2020).

Information on the role of organic products in food balance sheet in Poland is incomplete. The results of research by M. Zuba-Ciszewska and J. Zuba team refer to the importance of selected organic products in agricultural production. In 2014, the share of cereals in organic farming accounted for 1.31%, while for cereal production it was only 0.41%. The figures for potatoes were: 0.75 and 0.23%, vegetables: 11.32 and 0.54%, fruit: 12.01 and 1.34%, respectively. These data demonstrate that organic plant production was significantly less intensive than the total production. According to the above authors, the share of organic production of sheep's and goat's milk in total production of these products was noticeably higher and amounted to 55.38 and 35.22%, respectively (Zuba-Ciszewska and Zuba, 2016). The results of research by Jasiński et. al. demonstrate that in 2019 the share of organic food in the Polish food market fell within the range of 2-3% (Jasiński, Hałasiewicz, Śpiewak, and Dominiak-Woźniak, 2019), and therefore was lower than the share of organic farming areas in total agricultural land area, which accounted for 2.48% in 2018. In general, it can be stated that organic products in the agricultural product market in Poland were insignificant.

Regardless of the share of organic products in food balance sheet, their role is also demonstrated by the expenditure on organic food. Table 2 presents the annual expenditure on organic food in EUR/per capita in 2018 in the selected European countries and GDP per capita.

Table 2

GDP and annual expenditure on organic food per capita in the selected European countries in 2018 (EUR)

Country	GDP (USD thousand)	Food expenditure (EUR)
Switzerland	64.65	312
Denmark	52.12	312
Sweden	52.98	225
Austria	52.13	205
France	45.74	136
Germany	52.55	132
Netherlands	56.38	75
Italy	39.63	58
Czech Republic	37.77	12
Slovakia	35.13	8
Poland	31.94	7

Source: Lista państw... 2010; Schaack, 2020.

According to the data, expenditure on organic food depends largely on the economic development of a particular country which is measured by GDP per capita. The correlation coefficient, which amounts to 0.83, indicates a high correlation. The link between expenditure on organic food and GDP has also been pointed out by other authors (Smoluk-Sikorska, 2010; Kułyk and Michałowska, 2016; Hermaniuk, 2018). In Poland, expenditure per capita was EUR 3 in 2012, EUR 6 in 2017, and EUR 7.3 in 2018 (Kwasek, 2019; Schaack, 2020). Despite an upward trend, these figures should beregarded as low. Increased expenditure on organic food in Poland will depend on the GDP growth rate. When extrapolating the GDP growth rate from2010-2018 for the upcoming years, we may assume that the current German GDP (USD 52.55 thousand) will be reached by Poland in ca. 2028, and expenditure on organic food will be approx. EUR 100/per capita. Obviously,these are only estimates.

Development of organic farms in Poland from 2002-2018

The development of organic farms in Poland should be associated with the establishment of the "Ekoland" Association of Organic Food Producers in 1989 (Nowogródzka, 2012), which in 1990 certified 27 farms as organic. Individual organic farms operated in the 1980s, e.g. J. Osetka (Duda-Krynicka and

Jaskulewski, 2010). From 1990-2002, the number of organic farms hardly increased. In 2020, there were 882 certified organic farms, and 1,095 farms under conversion (Table 3). In the subsequent years, the number of certified organic farms increased, which should be linked with the Poland's accession to the European Union and supporting these farms by CAP funds (Łuczka-Bakuła, 2013). The highest number of certified farms was observed in 2015 (19,813). These farms

utilized 501.92 thousand ha of agricultural land, while their share in total agricultural land accounted for 3.45%. In parallel, the number of farms under conversion grew, reaching its peak in 2010, and amounted to 7,681 farms. In the subsequent years, a downward trend was observed. The number of certified farms decreased after 2015, while that of farms under conversion after 2010. In 2018, the number of certified organic farms amounted to 14,927 and was lower by nearly 25% compared with 2015. The number of farms under conversion plummeted and in 2018 accounted for only 4,280, which means a drop by 44% compared with 2010.

Table 3

Development of organic farms in Poland from 2002-2018

Year	Certified farms				Farms under conversion			
	Number of farms	Agricultural land (thousand ha)	Share (%)	Average farm area (ha)	Number of farms	Agricultural land (thousand ha)	Share (%)	Average farm area (ha)
2002	882	20.86	0.12	23.65	1,095	22.97	0.13	20.89
2005	1,951	37.49	0.23	19.21	5,231	122.22	0.77	23.36
2010	12,901	308.09	2.07	23.88	7,681	210.97	1.42	27.46
2015	19,813	501.92	3.45	25.33	2,464	78.80	0.54	31.98
2016	17,688	430.89	2.96	24.36	4,747	105.68	0.72	22.26
2017	15,470	383.24	2.62	24.77	4,787	111.73	0.76	23.34
2018	14,927	363.56	2.48	24.35	4,280	121.11	0.82	28.29

Source: Statistics Poland, 2009, 2016, and 2020.

Thus, a question arises as to what were the reasons behind the decreased number of organic farms, both certified and under conversion? The answer to this question is provided by some recognized organic farmers, namely: Zbigniew Babalski, Robert Kuryluk, and Peter Stratenwerth, who should be regarded as leading experts (Styczek-Kuryluk, 2020). They point out the following reasons: changes in the rules for supporting organic farms (mainly orchard farms – nut orchards) and related control and audit system (documentation), lack of labor force (despite theoretically large resources), droughts, animal welfare requirements (particularly difficult to implement on small farms, where farmers additionally work in the non-farming sector), and low soil productivity. Due to the latter factor, the restoration of the desired soil fertility (primarily of organic matter) requires more time and is associated with significant labor and financial resources.

In addition, according to the data provided in Table 3, the average area of organic farms in Poland amounted to 23.65 ha as of 2002-2018 and agricultural land area was between 19.21 and 25.33 ha, which is more than twice higher compared with the average farm area in Poland. The research by W. Wrzaszcz and J.S. Zegar also demonstrate that organic production is carried out by farmers managing larger farms (Wrzaszcz and Zegar, 2014). The previous statement (Komorowska, 2006; Mazur-Wierzbicka, 2016; Babalski, 2020) that organic farming is mainly the do-

main of small farms with high labor resources has not been confirmed in practice. The same applies to the statement that low use of industrial chemicals, such as mineral fertilizers and plant protection products (Komorowska, 2006; Duda-Krynicka and Jaskulecki, 2010; Kowalska, 2010), in effect of which farmers could more easily switch towards organic production methods, promotes the development of organic farming. The low average use of these products in Poland is linked to the fact that nearly 30% of farmers managing smaller farms, which are frequently without animal production and with extremely low expenditure on plant production, perceive them as auxiliary and these are used for self-sufficiency purposes (Józwiak, Mirkowska, and Ziętara, 2018). The key factor in organic farming is knowledge, which in many cases proves to be insufficient.

The specific feature of organic farms in Poland is the production structure defined as a ratio between plant and animal production. According to the baseline assumptions, organic farming is a management system of sustainable plant and animal production within the farm based on biological and mineral products that are not processed by technological means (Runowski, 1996; Nowogródzka, 2012). This means that such a farm is perceived as an "organism" based on a holistic approach. What is the difference between these assumptions and practice? Table 4 presents the production structure in organic farms in Poland from 2015-2018. At that time, organic farms that were predominant were those involved only in plant production. Their share was between 8.12 and 88.9% and displayed an upward trend in the following years. The share of farms with animal and plant production oscillated between 18.8-11.1%, showing a downward trend in the following years.

Such a prevailing share of plant farms is contrary to the organic farming concept. The presented figures demonstrate that the vast majority of farms which are regarded as organic, in reality are not organic, despite holding the appropriate certificates. The issue of "quasi-organic farms" has been brought up by many authors in the past (including among others Solska, 2011; Jasiński, Michalska, and Śpiewak, 2013; Pawlewicz, 2007). The structure of land use on organic farms from 2015-2018 identifies the following trends: an increasing share of sown area in agricultural land from 67.8 to 73.2%, a decreasing share of permanent grasslands from 25.6 to 20.6%, a relatively stable share of orchards amounting to 6.6-6.2% (IJHRS, 2017, 2019).

Table 4

Share of organic farms with plant production and mixed plant and animal production in Poland from 2015-2018 (%)

Type of farm	2015	2016	2017	2018
Farms with plant production only	81.2	83.3	88.9	88.4
Farms with plant and animal production	18.8	16.8	11.1	11.6
Total	100.0	100.0	100.0	100.0

Source: IJHRS, 2017, 2019.

Table 5 shows the crop structure of organic farms in Poland. The data allow the following conclusion: the crop structure is largely compliant with the recommended organization of plant production on organic farms from the environmental perspective. The share of cereal was lower than 40%, while the share of legumes was too low (2.8-5.3%). The share of vegetables accounting for 8.5-14.3% was significant. It is worth emphasizing the large share of fodder plants in the crop structure, which was between 54.8-35.2% and displayed a downward trend. From the environmental perspective, this share should be evaluated positively, although when considering the fact that more than 80% of farms have no animal production we may assume that some of these farms use no fodder plants for production purposes.

Table 5

Crop structure on organic farms in Poland from 2015-2018 (%)

Crops	2015	2016	2017	2018
Cereal	27.0	27.9	33.2	37.7
Legumes for seeds	2.0	3.4	4.7	5.2
Vegetables	10.8	14.3	10.6	8.5
Fodder plants	54.8	47.5	40.4	35.2
Industrial crops	1.7	3.7	8.0	9.6
Potatoes	0.5	0.4	0.4	0.4
Others	2.4	2.8	2.7	3.3
Total	100.0	100.0	100.0	100.0

Source: As for Table 4.

Development of organic farms in Germany from 2000-2018

The development of organic farming in Germany began in the second half of the 20th century, followed by the dynamic development of the country measured by GDP growth and high intensity agricultural production which contributed to deteriorated condition of natural environment. A significant role was played by the Green Party, which urged farmers to convert the production methods towards more environmentally friendly (Radkiewicz, 1995; Michalski, 2011). Organic farming started to develop rapidly after the implementation of support pursuant to Regulation No. 2092/91/EEC. Table 6 presents the quantitative development of organic farms in Germany from 1995-2018. In this period, their number increased from 6,643 to 31,713, i.e. by 377%. In 2018, the share of organic farms in the total number of farms accounted for 12%, which was by 10.9 pp. more compared with 1995.

Table 6

Development of organic farms in Germany from 1995-2018

Year	Organic farms				Average farm area (ha)	
	Number of farms (items)	Share in the total number of farms (%)	Agricultural land of organic farms (thousand ha)	Share in agricultural land (%)	Organic	In total
1995	6,642	1.10	309.5	1.80	46.60	42.80
2000	12,732	2.70	546.0	3.18	42.90	47.60
2005	17,020	4.36	807.4	4.74	47.44	42.10
2010	21,942	7.33	990.7	5.93	43.40	55.84
2015	25,078	8.98	1,088.8	6.53	43.40	59.63
2017	29,764	10.78	1,373.2	8.21	46.13	60.54
2018	31,713	12.00	1,521.3	9.10	48.00	61.00

Source: Statistisches Jahrbuch über Ernährung Landwirtschafts und Forsten 2010 and 2019, Landwirtschaftsverlag, Münster.

The share of agricultural land area in organic farms from 1995-2005 was higher than their share in the total number of farms. This resulted from an increase in the area of organic farms by 3.5% in these years compared with the average area of total farms. In the following years (2010-2018), the share of organic farms in agricultural land area was lower than their share in the total number of farms. In this period, the area of organic farms amounted to 45.2 ha on average and was lower by 23.6% from the average area of farms in total, i.e. 59.2 ha in these years and 61 ha in 2018. At that time, the area of organic farms increased by 3%, while the area of farms in total by 42.5%. This means that farms in total were under greater pressure of market forces compared with organic farms. The production intensity level on German organic farms was lower than in the case of farms in total. This is confirmed by the lower share of organic production in the food product market comparing to the share of food products in agricultural land. According to the available data, in 2009 the share of organic products In the food product market was 3.4% (Golinowska, 2013), while the share of organic farming area in total agricultural land area amounted to 5.93% in 2010. The difference was 2.5 pp. In 2018, the share of organic products in the food product market accounted for 5.3% and was lower by 3.8 pp. from the share of organic farms in agricultural land (Schaack, 2020). These data prove the niche nature of organic production in Germany despite continuous increase in the number of organic farms. The issue whether this trend will continue in the future remains open.

Organization and economic results of the Polish organic and conventional farms of mixed type

The figures specifying the organization and economic results of the Polish organic and conventional farms of mixed type[6] are provided in Tables 7 and 8. The analyzed groups of farms were divided into five size classes: 5-10; 10-20; 20-30; 30-50 and >=50 ha of agricultural land. The areas of both farm types were similar within the classes. The only exception is 2010, in which the organic farming area in the group of farms with an area of 50 ha and more amounted to 126.87 ha of agricultural land and was larger by 44.6% compared with conventional farms.

A specific feature of plant production organization is the share of cereal in a sown area. In terms of organic farms, the larger the farming area is, the less cereal is sown. The highest share of 58.5% was recorded on farms with an agricultural land area of 5-10 ha. This should be regarded as high. In the case of organic farms, this share should be below 50%. At that time, the share of cereal in the group of farms with an area of 50 ha and more decreased and amounted to 47.2%. The share of cereal in the case of conventional farms was also the highest in the group of farms with an area of 5-10 ha and amounted to 78.6. It should be regarded as very high. According to Good Agricultural Practice, the share of cereal in a sown area should not be higher than 60% (Ministry of Agriculture and Rural Development, 2004). In the group of farms with an area of 50 ha and more, it decreased to 63%. The results of research covering the entire group of farms indicate that the production structure in the case of smaller farms is less environmentally and climate friendly due to the high share of cereal (75%), lack of livestock, and soil liming (Statistics Poland, 2017; Ziętara, Zieliński, Mirkowska i Józwiak, 2021). These regularities do not confirm the thesis that smaller farms are more environmentally friendly (Zegar, 2012). The other feature of the organic and conventional farms is stocking density expressed as the number of livestock units per 100 ha of agricultural land.

[6] Mixed-type farming (TF8) includes the following principal types: 73. Mixed livestock, mainly grazing livestock, 74. Mixed livestock, mainly granivores, 83. Field crops – grazing livestock combined, 84. Various crops and livestock combined

Table 7

Features of organic and conventional farms (mixed type) in Poland

Size class (ha)	2010		2015		2018	
	organic	conventional	organic	conventional	organic	conventional
Farm area (ha of agricultural land)						
5-10	7.73	7.92	8.17	7.88	8.16	7.89
10-20	14.39	14.65	14.88	14.85	14.00	14.75
20-30	27.04	24.58	24.51	24.59	23.94	24.54
30-50	39.25	38.46	39.55	38.46	38.01	38.61
>=50	126.87	87.71	82.27	80.15	80.26	79.69
Share of cereal in sown area (%)						
5-10	58.73	77.23	57.94	78.74	58.97	79.85
10-20	55.24	75.44	45.82	73.29	50.49	75.10
20-30	47.39	72.16	37.78	69.76	42.36	70.61
30-50	52.10	70.85	38.69	66.19	45.75	66.70
>=50	58.93	66.12	35.42	61.70	47.42	61.33
Stock density (SD/100 ha of agricultural land)						
5-10	73.80	77.10	78.73	78.50	53.62	82.90
10-20	56.27	82.02	59.34	91.80	46.47	94.19
20-30	55.88	83.38	48.64	94.92	46.89	96.79
30-50	45.58	79.03	41.01	90.55	48.63	91.59
>=50	38.89	55.00	61.42	79.37	39.51	78.49
Cereal yield (dt/ha)						
5-10	23.32	32.02	27.37	37.62	25.71	36.85
10-20	23.47	35.49	29.53	41.52	23.46	38.20
20-30	25.94	38.85	23.10	44.91	20.87	41.17
30-50	20.28	42.71	22.39	47.69	20.48	41.45
>=50	16.40	42.77	20.59	51.42	18.11	44.78
Milk yield of cows (kg/cow)						
5-10	3,073.61	3,206.03	3,320.25	3,159.08	4,878.78	3,200.56
10-20	3,510.38	3,770.73	3,528.15	3,756.95	3,916.63	4,089.26
20-30	3,381.94	4,252.42	3,749.87	4,668.40	4,040.00	5,055.73
30-50	3,211.66	4,621.26	2,737.41	5,230.73	3,872.31	5,552.59
>=50	3,454.86	5,368.11	4,990.20	5,986.00	5,519.35	6,272.12
Selling price of cereal (PLN/dt)						
5-10	49.22	53.20	54.59	57.68	66.37	63.68
10-20	48.78	51.54	60.64	58.80	62.52	63.70
20-30	48.85	54.14	49.04	60.68	67.03	66.05
30-50	53.51	54.99	58.04	62.04	67.63	66.25
>=50	48.41	53.95	55.71	62.64	64.09	68.31
Selling price of milk (PLN/kg)						
5-10	0.87	0.88	1.12	1.05	1.28	1.14
10-20	0.99	0.91	1.07	0.97	1.34	1.12
20-30	0.94	0.92	0.99	1.00	1.21	1.15
30-50	1.00	0.96	1.00	1.02	1.27	1.23
>=50	1.07	1.02	1.06	1.08	1.34	1.27

Source: Goraj, Bocian, Osuch, and Smolik, 2012; Bocian, Osuch, and Smolik, 2017; Bocian et al., 2020.

The highest stocking density was recorded in the smallest farms with an agricultural land area of 5-10 ha. It was similar in the case of organic and conventional farms in 2010 and 2015 amounting to 74-79 SD. It should be regarded as medium. In 2018, stocking density was lower on organic farms and amounted to 54 SD/100 ha, while in the case of conventional farms it was 83 SD. Stocking density on organic farms declined while the area of farms increased. In the analyzed years, it decreased from 68.7 SD (farms with an area of 5-10 ha) to 46.6 SD in the largest ones on average. It can be stated that stocking density on organic farms met the minimum requirements in terms of the balance of organic matter in soil.

Arable crop yields on organic farms were lower compared withconventional farms. Due to a lack of information on yields of all arable crops, cereal yields were used. Owing to the prevalence of cereal in the sowing structure, cereal yields can be regarded as a reliable indicator. In the analyzed years, cereal yields on organic farms fell within the range between 25.9 and 16.4 dt/ha. They demonstrated a downward trend along with an increased farm area. With regard to conventional farms, cereal yields fell within the range between 32.0 and 51.4 dt/ha and featured an upward trend with an increased farm area.

Cereal yields on organic farms were lower than in the case of conventional farms. The difference in cereal yields rose with an increased farm area. In the case of 5-10 ha farms, cereal yields were lower by 28%, while in the case of farms with 50 ha and more by 60%. It can be assumed that cereal yields on organic farms were lower by 47.7% on average.

The differences in the cow's milk yield were lower. In the case of the smallest farms (5-10 ha), the cow's milk yield on organic farms amounted to 3,757 kg and was higher by 17.8% than on analogical conventional farms. In the subsequent groups, the cow's milk yield on organic farms was within the range from 3,651 kg in the case of farms with an area of 10-20 ha to 4,655 kg on the largest farms. It was lower than the milk yield on conventional farms by 6% in the group of farms with an area of 10-20 ha. In the subsequent groups, the difference was 20, 36, and 21%, respectively.

There is a reasonable belief that the selling prices of organic products should be higher compared with the conventional ones. In the case of cereals, it is sometimes different: in 2010 and 2015, the prices of cereals from organic farms were lower by 7 and 8%, respectively. In 2018 the prices were identical. These results demonstrate that the market of organic cereals does not operate properly[7]. A similar situation is observed on the organic milk market. In 2010 and 2015, its selling prices were higher by 3%, while in 2018 by 9%.

Table 8 presents the economic results of the analyzed groups of farms.

[7] Not all farmers managing the certified organic farms may obtain higher prices for the sold products due to lack of purchasers on the local market.

Table 8

Economic results of organic and conventional farms in Poland (mixed type) from 2010-2018

Size group (ha)	2010		2015		2018	
	organic	conventional	organic	conventional	organic	convenional
Total production (PLN thousand/ha)						
5-10	4.26	5.28	7.38	5.59	6.29	5.54
10-20	3.75	5.09	4.07	5.52	4.08	5.66
20-30	2.17	5.11	2.52	5.69	2.92	5.93
30-50	2.82	5.14	2.15	5.66	3.18	5.85
>=50	2.04	4.45	3.98	5.85	2.68	6.08
Farm income (PLN thousand/farm)						
5-10	20.68	16.91	28.13	12.26	18.45	9.43
10-20	36.64	30.77	37.31	24.97	36.42	25.65
20-30	57.46	55.00	44.43	46.91	51.36	49.44
30-50	78.65	91.17	60.42	65.12	88.60	74.25
>=50	198.80	181.36	210.30	136.41	173.38	155.31
Farm income per family work unit (PLN thousand/FWU)						
5-10	13.88	12.08	19.95	9.01	13.27	6.83
10-20	25.80	18.65	23.64	15.41	24.61	16.33
20-30	34.30	31.25	27.94	26.65	34.94	29.78
30-50	46.00	49.55	38.48	35.01	57.16	41.95
>=50	125.80	93.00	125.93	66.54	89.37	79.24
Share of total payments in farm income (%)						
5-10	78.89	64.85	50.61	65.72	158.33	216.61
10-20	75.70	56.67	67.00	69.36	99.58	107.58
20-30	74.16	53.38	94.12	62.19	126.23	86.44
30-50	81.56	49.75	109.59	67.06	102.78	88.67
>=50	90.56	52.05	61.37	61.68	89.28	75.31
Competitiveness index						
5-10	0.45	0.38	0.53	0.25	0.32	0.17
10-20	0.69	0.56	0.61	0.39	0.57	0.54
20-30	1.00	0.87	0.67	0.64	0.74	0.67
30-50	1.17	1.08	0.83	0.80	1.15	0.90
>=50	2.24	1.94	2.31	1.32	1.67	1.41

Source: Goraj et al., 2012; Bocian et al., 2017, 2020.

In the following years, soil productivity on organic farms defined as the value of total production per 1 ha of agricultural land, demonstrated a downward trend with an increased farm area. In the case of farms with an area of 50 ha and more, it was lower than productivity in the group of farms with an agricultural land area

of 5-10 ha by 52, 46, and 57%, respectively. In the group of conventional farms, soil productivity in the group of farms with an area of 50 ha and more was lower by 16% than in the case of the smallest farms only in 2010. In 2015 and 2018, the soil productivity rate was similar in each group. The differences between organic and conventional farms are noticeable. Average production levels of organic farms in 2010, 2015, and 2018 was PLN 3.0, 4.0, and 3.3 thousand, respectively, and was lower than that of conventional farms by 40.1, 29.3, and 42%, respectively. In simple terms, it can be assumed that soil productivity of organic farms was lower by 37% on average than in the case of conventional farms. These data correspond with the previous analysis of cereal yields, which in the case of organic farms were lower by 47.7% on average. The differences in soil productivity between organic and conventional farms are confirmed by the study by D. Komorowska, according to which from 2007-2009 soil productivity of organic farms was lower by 31% (Komorowska, 2012). The study by Krupa et al. demonstrated that in 2010, 2011, and 2012 soil productivity of organic farms covered by FADN research were lower by 64, 59, and 57%, respectively, comparing to the entire group of FADN farms (Krupa et al., 2016).

Farm income rose along with farm size. Farm income per family work unit allows for comparing it with the income of workers in the non-agricultural sectors of the national economy. It forms a basis to establish the income parity. In 2010, average remuneration in the national economy was PLN 25.81 thousand/year (Ziętara, 2012). In this year, this parity income was earned by the farmers of organic farms with an area of 10-20 ha and conventional farms with an area of 30-50 ha and more. In 2015, income at the level of income parity (PLN 31.23 thousand) was earned by the farmers in both types of farms in the group of farms with an area of 30-50 ha (Ziętara, 2017). Also in 2018, farms in this group earned the income above the parity income, amounting to PLN 39.4 thousand in this year (Skarżyńska, Augustyńska, Czułowska, and Abramczuk, 2020).

A significant factor affecting the value of parity income from a farm is all the payments received by the farms under CAP. On organic farms, in the case of the smallest farms (5-10 ha), the average share of subsidies in farm income was 96% and was lower than the share in conventional farms, where it amounted to 116%. In the remaining groups of farms, the share of payments in income fell within the range from 80 to 98% in the case of organic farms, while in terms of conventional farms it was from 63 to 78%. The share of payments in income was higher in the case of organic farms compared with conventional farms and accounted for between 17 and 20%.

A synthetic indicator informing on management efficiency is the competitiveness index[8] that at the same time provides information on development capacity. According to data presented in Table 8, in 2010 such a capacity was demonstrated by organic

[8] The competitiveness index is calculated as the ratio between the farm income and costs of own production factors (labor, land, and capital). The index value between 1 and 2 indicates a farm's capacity to compete, while farms with a competitive index reaching the value of 2 and more are regarded as fully competitive (Kleinhanss, 2015).

farms with an area of 20-30 ha and more as well as conventional farms in the with an area of 30-50 ha and 50 ha and more. In 2015, both types of farms with an area of 50 ha and more demonstrated their competitive capacity. In 2018, organic farms showed their competitive capacity in the group of farms with an area of 30-50 ha as well as 50 ha and more, while conventional farms demonstrated such a capacity only in the group of farms with an area 50 ha and more. In this group, the competitive capacity of organic farms was higher. In general terms, it may be stated that organic farms with an area of30-50 ha and more demonstrated a higher competitive capacity.

Therefore, a question arises about the production effects of increasing the share of agricultural land under organic famingto 25% in Poland until 2030. Determining these effects is very risky owing to the need to adopt assumptions of a subjective nature. In the first-case scenario, the existing trends in the production structure and rate assumed to continue, whereby the leitmotiv behind decisions on running organic farms was the value of subsidies. This resulted in an increase of organic farms and agricultural land under organic farming. These phenomena did not translate into a proportional growth of organic production. Adopting the extrapolation method means accepting the status quo, in which the vast majority of organic farms are organic in name only. The projections pointing out at the potentially high demand for organic products are uncertain. The existing experiences demonstrate that the change of the eating habits is very slow. In addition, demand for organic products and the acceptance of higher prices depend on the society's wealth. When attempting to determine the production effects of increasing the share of agricultural land in organic farms to 25% until 2030, the following assumptions were made:

– increasing the share of agricultural land in organic farms from 2.48% in 2018 to 25% in 2030 and the area from 363.5 thousand ha to 3,664.92 ha in 2030;
– the production rate from 1 ha of agricultural land in the case of organic farms will be lower by 34% compared with farms in total;
– differences in the production rate are established according to 2018 prices.

Calculations based on these assumptions demonstrate that the effect of increasing the share of agricultural land in organic farms to 25% will be lowering of total agricultural production by 11%.

In the second-case scenario, assuming that changes in the structure of organic farms consisting in mandatory animal production to a minimum extent (at least 0.5 SD/ha of agricultural land), excluding orchard farms and an increase in the society's wealth, decrease in production may be lower than in the first-case scenario.

Organization and economic results of the organic and conventional farms in Germany

German organic farms were compared with conventional ones in 2009/2010 and 2017/2018. The respective figures are presented in Tables 9 and 10. The number of organic farms in these years was 385 and 449, respectively, while their share in the number of comparable conventional farms accounted for 15 and 21%, respectively. Despite the differences in the number of the analyzed farms, the state-

ments formed on their basis are reliable. The areas of the analyzed groups of farms were similar. In 2009/2010, the areas amounted to nearly 90 ha of agricultural land, while in 2017/2018 they were higher by approximtely 30% on average. The area of organic farms in the latter year amounted to 120.3 ha and was twice higher than the average area of farms in total. In addition, it was five times higher than the area of Polish organic farms, which amounted to nearly 24 ha on average in 2018. The share of permanent grasslands in organic farms in 2017/2018 was higher and accounted for 44.3%, while in the case of conventional farms this was 36%. The share of cereal in the sown area in the cas of organic farms accounted for 53%. This should be regarded as higher than the recommended values (50%). With regard to conventional farms, it accounted for 56% and complied with the recommendations. Stocking density on organic farms in these years was 60.8 and 63.6 SD/100 ha, respectively, which met the requirements for such farms. With respect toi conventional farms, stocking density was higher and amounted to 80.2 and 91.4 SD/100 ha of agricultural land, respectively. Information on cereal yields refers to 2017/2018. These were 32.7 dt/ha for organic farms, while in the case of conventional farms the yields were higher by 89.6%. Information on wheat yields refers to both years. They amounted to 31 and 30.5 dt/ha, respectively, and were higher on conventional farms by 130% on average. Milk yield of cows on organic farms in these years was 5,879 and 6,510 kg, respectively. In the case of conventional farms, it was higher by 9 and 12%, respectively. Milk yields achieved by organic farms should be regarded as high.

Table 9

Features of German organic and conventional farms in 2009/2010 and 2017/2018

Specification	2009/2010		2017/2018	
	organic	conventional	organic	conventional
Number of farms	385	2,554	449	2,088
Area (ha of agricultural land)	92.7	90.0	120.3	116.3
Share of permanent grassland in agricultural land (%)	-	-	44.3	36.0
Share of cereal (%)	-	-	53.7	56.1
Stocking density (SD/100 ha)	60.8	80.2	63.6	91.4
Cereal yield (dt/ha)	-	-	32.7	62.0
Wheat yield (dt/ha)	31.0	71.4	30.5	70.7
Milk yield of cows (kg/cow)	5,879	6,412	6,510	7,299
Wheat prices (EUR/dt)	26.0	11.7	40.6	15.2
Potato prices (EUR/dt)	29.0	10.1	46.0	10.1
Milk prices (EUR/kg)	0.38	0.28	0.49	0.37

Source: Statistisches Jahrbuch über Landwirtschaft, Ernährung und Forsten 2015 and 2019, Bundesinformationszentrum Landwirtschaft.

Significant differences in the prices of plant products were observed. In the analyzed years, the selling prices of wheat in the case of organic farms amounted to: EUR 26.0 and 40.6 per 1 dt, respectively, and were higher compared withconventional farms by 122 and 167%, respectively. The differences in the selling prices of potatoes were even higher accounting for 187 and 355%, respectively. The differences in the selling price of milk were slighter. In 2009/2010, the selling price of milk in the case of organic farms amounted to EUR 0.38/kg, while in 2017/2018 it was EUR 0.49/kg and was higher compared with conventional farms by 35.7 and 32.4%, respectively. The selling prices of wheat, potatoes, and milk in 2017/2018 were higher than in 2009/2010 by 56, 58.6, and 29%, respectively. The smaller difference in the selling price of milk between the organic and conventional farms results from poorer development of the organic milk market. Significantly higher prices of milk were obtained by the farmers in a direct sales scheme.

Table 10 presents the figures specifying the economic effects of the analyzed types of farms per 1 ha of agricultural land. Revenue from sales in the case of organic farms in the first year amounted to EUR 1,305 and was lower by 7.3% compared with conventional farms, while in the second year it amounted to EUR 1,825 and was lower by 10.3%. In both types of farms, revenue from sales was dominated by animal production, whose share accounted for nearly 60%. In the analyzed years, other revenue in the case of organic farms was higher by 23.5 and 53.5%, respectively. The revenue of organic farms was dominated by payments with the share of 73 and 86.4%, respectively, compared with conventional farms where the share was 68.4 and 80.2%, respectively. The total revenue in both types of farms was similar. In these years, organic farms recorded higher revenue by 1.2% and 0.5%, respectively.

Table 10

Production and economic results of the organic and conventional farms in Germany in 2009/2010 and 2017/2018 (EUR/ha of agricultural land)

Specification	2009/2010		2017/2018	
	organic	conventional	organic	conventional
Revenue from sales	1,305.0	1,408.0	1,825.0	2,035.0
including: from plant production (%)	33.6	37.6	27.2	26.1
from animal production (%)	58.5	56.9	60.8	62.1
Other revenue	744.0	602.0	720.0	469.0
including payments (%)	73.0	68.4	86.4	80.2
Total revenue	2,049.0	2,010.0	2,545.0	2,531.0
Costs (EUR/ha)	1,588.0	1,607.0	1,953.0	2,047
including: tangible (%)	40.0	50.0	39.7	52.9
employment (%)	10.1	5.2	12.7	7.5
other (%)	-	-	32.0	26.9
Farm income (EUR/ha)	461.0	403.0	592.0	484.0
Share of payment in farm income (%)	-	-	105.0	82.0

Source: Statistisches Jahrbuch über Landwirtschaft, Ernährung und Forsten, Bundesinformationszentrum Landwirtschaft 2019.

The costs among organic farms were slightly lower by 1.2 and 4.6%, respectively. The share of tangible costs was lower by 10 pp. on average, while the share of employment costs was higher by 4.9 and 5.2 pp., respectively. The income of organic farms amounted to EUR 461 and 592 per 1 ha, respectively, and was higher compered with conventional farms, where it was14.4 and 22.3%, respectively, owing to higher payments. Their share in the organic farm income in 2017/2018 was105%, while the conventional farm income was 82%. The difference was 23 pp.

Considering the minor differences in revenue between organic and conventional farms (1.2 and 0.5%, respectively) and a market of organic products more developed than in Poland, it may be stated with a high degree of certainty that increasing the share of agricultural land in the German organic farms from 9.1% in 2018 to 25% in 2030 will not result in significant production decrease. In addition, subject to maintenance of the existing support, the income generated by organic farms will not be lower compared with conventional farms.

Agricultural production systems and the Green Deal

The agricultural production systems that can be thecomponents of the Green Deal include organic, integrated, and precise farming. The implementation of these production systems may effectively contribute to climate and biodiversity protection. Considering Poland, one may have reasonable doubts as to the role of organic farming. Despite a growing number of organic farms up to nearly 20 thousand until 2015 and their share in agricultural land of 3.45%, p experience so far in this field is not optimistic. After the growth period a downward trend was observed. In 2018, the number of organic farms decreased by nearly 25% and their share in agricultural land dropped to 2.45% compared with 2015. The share of organic products in agricultural production was lower than the share in agricultural land. This activity has been uncommon. The opportunities for increasing organic production up to 25% of agricultural land are therefore very limited. It should be also noted that some organic farms were fake. In such case, pursuing an increased number of organic farms will result in lower production. The above prerequisites raise doubts as to the effectiveness of this method of climate and biodiversity protection.

It seems that an integrated agricultural production system, which effectively implements the environmental, economic, and social objectives, demonstrates a greater capacity in this area. The results of studies by Diercs and Heitefuss indicate that the use of plant protection products in this system, ranging from 33 and 57%, caused no significant deterioration in the volume of crops (wheat by 10%, while crops of sugar beet and field bean grew by 2%), subject to similar value of direct income (direct surplus) (after: Kuś and Stalenga, 2006). The results of research by E. Majewski on Polish farms were similar. Farmers applying integrated production systems obtained similar crop yields compared with farmers applying the conventional system, a higher direct surplus at lower use of plant protection products and nitrogen fertilizing (Majewski, 1995, 2008). The number of farms

applying the integrated agricultural production system (certified) is low. In 2018, it was only 3,876 farms and their share in farms in total accounted for 0.26% and in agricultural land for 0.15% (Statistics Poland, 2020).

The presented figures, both from organic farms and farms applying the integrated agricultural production system, indicate that farmers are reluctant to formalize their activity, despite the fact that they introduce many components of these systems into their farms. Thus, a question arises as to the purpose of special support for these production systems. Would not a more flexible approach be better for implementing principles that promote climate and biodiversity protection, e.g. payments related to introduction of "eco-schemes"? One example here is the direct payment scheme applied in Switzerland, which provides payments for the so-called "organic services", including:

- use of animal friendly breeding systems,
- sustainable fertilization balance,
- specific share of organic areas,
- required crop rotation,
- use of appropriate soil protection systems,
- use of the selected plant protection products (Pfefferli, 2011).

Conclusions

1. The implementation of the Green Deal objectives concerning climate and biodiversity protection in Poland, primarily by reaching 25% of agricultural land under organic production while also maintaining the existing trends is questionable. It will cause a decrease in agricultural production by nearly 11%.
2. The actual development of organic production depends on demand for organic products and readiness of the consumers to accept their higher price, which is associated with the wealth of societies measured by GDP per capita. Considering the existing GDP in Poland, it is difficult to assume a strong increase in demand for organic products.
3. In the vast majority of the analyzed countries, except from Austria, Denmark, and Italy, and partially Germany, organic production is niche in nature.
4. One specific feature of Polish organic farms is the fact they focused only on one type of activity. More than 80% of them were involved in plant production only, which is in contrary to the concept of organic farming. The average area of these farms amounted to 24.5 ha and was at least twice as large as the average area of farms in Poland.
5. Considering the limited resources under CAP allocated to environmental objectives and climate protection, there is a doubt as to special support available for organic farm development. These farms should benefit from support on equal principles with the other farms implementing the agri-environmental programs and "eco-schemes". The nature of their activity provides them with more extensive opportunities to implement these programs and therefore to benefit from sup-

port. Organic farms should operate on market terms. Holding a certificate should promote their bargaining power towards the purchasers. In such a situation, their development would depend on the actual demand for organic products.

6. Implementing the principles of farming promoting climate protection and biodiversity is much easier in the case of large-scale commercial farms. Their development depends on removing the obstacles that prevent their production structure from improving.

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ZIELONY ŁAD – W KIERUNKU ROLNICTWA EKOLOGICZNEGO CZY EKOLOGIZACJI ROLNICTWA?

Abstrakt

Celem badań prezentowanych w artykule jest ocena gospodarczych i społecznych skutków zwiększenia powierzchni użytków rolnych (UR) w użytkowaniu gospodarstw ekologicznych w Polsce. Zwiększenie udziału gospodarstw ekologicznych w UR mogłoby spowodować zmniejszenie poziomu produkcji rolniczej, co zagrażałoby bezpieczeństwu żywnościowemu. Konkurencyjnym rozwiązaniem mogłoby być wdrożenie zasad integrowanego i precyzyjnego systemu produkcji o większym zasięgu niż uprawy ekologiczne, co w wyższym stopniu przyczyniłoby się do realizacji celów środowiskowych oraz ochrony klimatu przy zachowaniu dotychczasowego poziomu produkcji. W realizacji przyjętych celów zastosowano metodę porównawczą: przedmiotem szczegółowych badań są gospodarstwa ekologiczne z Polski i Niemiec przedstawione na tle gospodarstw realizujących konwencjonalne systemy produkcji rolniczej. Wyniki badań wskazują, że realizacja założeń Zielonego Ładu o zwiększeniu udziału produkcji ekologicznej do 25% powierzchni UR w Polsce przy zachowaniu dotychczasowych tendencji spowoduje spadek produkcji rolniczej o około 11%. Rozwiązaniem konkurencyjnym jest skierowanie środków WPR na wspieranie działań i programów prośrodowiskowych we wszystkich gospodarstwach. Uczestnictwo w tych programach powinno być dobrowolne.

Słowa kluczowe: gospodarstwo rolne, gospodarstwo ekologiczne, Europejski Zielony Ład, systemy produkcji rolniczej.

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