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THE IMPLEMENTATION OF ENVIRONMENTAL ASPECTS OF THE SUSTAINABLE DEVELOPMENT IN POLAND AND IN THE EUROPEAN UNION

Abstract: The aim of the study is to present selected methods and results of implementation of environmental assumptions of sustainable development concept in European Union countries and especially in Poland after 2004 based on the statistical data from Eurostat. The measures of implementation of environmental goals are: share of permanent meadows and pastures area, area of forests and trends in afforestation process, number and area of organic farms and area of Natura 2000 protection. The main method used in this article is vertical and horizontal statistical analysis of gathered data and its synthetic presentation in graphs and tables.

Keywords: forests, grassland, meadows, Natura 2000, organic farms, pastures, , sustainable development

INTRODUCTION

The scientific description and popularization of the concept of sustainable development have origins in the 70s of the XX century. It was created as an answer for intensive economic development observed in the other half of the XX century. Negative effects of the economic development are over-exploitation of natural resources, dynamic growth of the population and deterioration of the natural environment [Żmija 2014]. The main ecological issues referred to water, air and soil pollution. One of the most important causes of this degradation is contemporary model of agriculture, that assumes specialization and intensification of agricultural production to maximize profits of the agricultural activities [Kutkowska, Kotecki 2012].

According to the report of WCED the sustainable development is meeting the needs of people and taking into account needs of future generations [Our Common Future 1987]. The basis of sustainable development is reasonable manage of natural resources which exclude prodigality. The process of implementation of the concept should be accomplished in three dimensions: social, economic and environmental. Sustainable development should play particular role in agriculture which bases on accessibility and quality of resources especially the land. Care of the agricultural land should result of its peculiar features which is: non-translocation, non-multiplication, indestructibility, spatiality and limitation of area [Kapusta 2012]. At the same time intensive agrotechnical treatments which are applied in farms causes negative influence on state of the natural environment especially on the degradation of agricultural soil and the condition and quality of water. Such actions are in conflict with environmental purposes of the sustainable development.

After 2004 phenomenon of growing importance of concept of the sustainable development in Poland is observed. Role and methods of its implementation defines, among others, Strategy of Sustainable Development of Rural Areas, Agriculture and Fishing in years 2012-2020 (Ministry of Agriculture and Rural Development) and Long-term Strategy of Country Development Poland 2030 (Ministry of Administration and Digital Affairs).

The aim of the study is to present methods and results of implementation of sustainable development in agriculture in specified groups of European Union countries basing on the statistical data from Eurostat. The measures of implementation of environmental goals are: area of permanent meadows and pastures, area of forests, number and area of organic farms and area of Natura 2000 protection.

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The article presents only selected indicators of sustainable development in agriculture because of the volume restrictions of the article.

METHODOLOGY

The study addresses issues related to implementation of the sustainable development concept in agriculture in European Union after 2004. Selected indicators of sustainable development in this paper are:

- area of permanent meadows and pastures,
- area of forests,
- area and number of organic farms,
- area of Natura 2000 protection.

Considerations were made on the basis of EUROSTAT statistical data resource and related to three periods: 2005, 2010, 2015. In this study statistical methods, which include the rate of dynamic changes, the trend and determination of the average values of the studied phenomena were employed. Considerations were based on the vertical analysis (compilation of statistical data in years 2005, 2010, 2015) and horizontal one, comparing the data in a spatial system.

In the analysis three groups of countries were featured:

1. Values for all the members of the EU
2. Values for the old members (participants before 2004: Austria, Belgium, Netherlands, Luxembourg, Spain, Portugal, Italy, Greece, Germany, United Kingdom, France, Sweden, Finland, Denmark, Ireland)
3. Values for the new members (participants after 2004: Czech Republic, Poland, Lithuania, Latvia, Estonia, Malta, Cyprus, Slovakia, Slovenia, Croatia, Bulgaria, Romania, Hungary).

Data for Poland were presented independently of mentioned groups to present trends for the country and to compare it to data for these groups of countries.

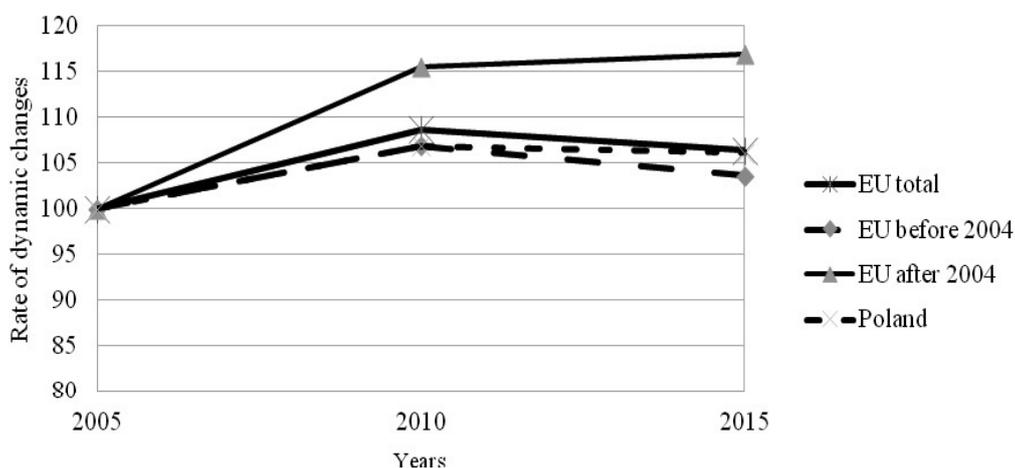
RESEARCH OUTCOMES

1. Permanent meadows and pastures

Permanent meadows and pastures are the land under grass and other green crops are important both for agriculture as for the environment. The main agricultural function is animal feeding. Also, there are many environmental functions of permanent meadows and pastures, for example soil protection against water and wind erosion, water retention, peat soil mineralization and habitat for rare animal and plant species [Kucharski 2010]. Meaning of permanent meadows and pastures is underlined in Common Agricultural Policy and the program of greening is the method that aims to protect area of grassland [Zazielenienie... 2014].

Chart 1. presents dynamic of changes of area of permanent meadows and pastures. In all analyzed groups increase of area of permanent meadows and pastures comparing to 2005 was observed. In the European Union countries jointly, in members before 2004 and in Poland the dynamic curve is similar – growth of permanent meadows and pastures area by about 7% in period from 2005 to 2010 and than slight decrease after 2010 were observed. In group of members of the EU after 2004 the curve of the dynamic of changes of grassland area was opposite. In that group constant growth of grassland area was observed. It is result of implementation of environmental payments from the EU budget for the new member states [Jankowska-Huflejt, Domański 2008].

Chart 1. The dynamic of changes of area of permanent meadows and pastures in European Union after 2004 (%)



Source: own study based on EUROSTAT

Analyzing permanent meadows and pastures, the share of each group in total area of grassland in the EU was studied (table 1). More than 3/4 of permanent meadows and pastures is located in countries of the old EU-15. Its share in studied period was shrinking in the old EU-15 for the benefit of new members where, according to the chart 1., was observed trend of growing area of permanent meadows and pastures. It is also effect of accession of new members in 2007 and 2013. In 2005 the share of permanent meadows and pastures area in group of new members was 20,61% of total area of grassland in the EU and until 2015 it increased by 2%. Poland is country with substantial areas of grassland. It is over 5% of total area of grassland of the EU in whole period.

Table 1. The participation of area of permanent meadows and pastures in specific groups in comparison to total area of permanent meadows and pastures of EU countries after 2004 (%)

Specification/Year	2005	2010	2015
EU total	100	100	100
EU before 2004	79,39	78,08	77,33
EU after 2004	20,61	21,92	22,67
Poland (in comparison to total EU)	5,39	5,31	5,38
Poland (in comparison to EU after 2004)	26,17	24,21	23,75

Source: own study based on EUROSTAT

2. Organic farming

Another analyzed factor presenting implementation of environmental goals of the sustainable development in agriculture are number and area of organic farms. The organic farming is agricultural system based on sustainable plant and animal production. Organic production should be



supported by pro-ecological methods of farming, should support biodiversity, use natural processes and ensure animal welfare. There are many fields in CAP that support development of organic farms [Plan... 2011].

As we can see in table 2. majority of organic farms is located in the EU-15, but in researched period the share was shrinking (from 90,97% in 2005 to 77,24% in 2015). The reason of that occurrence is starting up the process of financing of the organic farming among new members and, as a result, growing number of organic farms. Poland is important producer of organic food in EU. In 2015 more than 8% of all organic farms in EU were located in Poland. However, number of organic farms in Poland is decreasing after 2010. Poland is also the most important producer of organic food in group of the new members (over 36% of total number of organic farms in 2015).

Table 2. The participation of number of organic farms in specific groups in comparison to total number in EU countries after 2004 (%)

Specification/Years	2005	2010	2015
EU	100	100	100
EU before 2004	90,97	81,61	77,24
EU after 2004	9,03	18,39	22,76
Poland (in comparison to total EU)	4,53	9,35	8,22
Poland (in comparison to EU after 2004)	50,18	50,84	36,10

Source: own study based on EUROSTAT

Table 3. presents participation of area of organic farms in specific groups in comparison to total number of European Union countries. Trend in area of organic farms in researched period is similar to trend in number of organic farms. Over 75% of area of organic farms is located in the „old EU” but this share is about 10% smaller than in the beginning of researched period. The opposite trend present countries of the new EU where area of organic farms is growing (over 23% in 2015). Poland contains 6,39% of total area of organic farms in EU and over 27% in group of the new members.

Table 3. The participation of area of organic farms in specific groups in its total area in EU countries after 2004 (%)

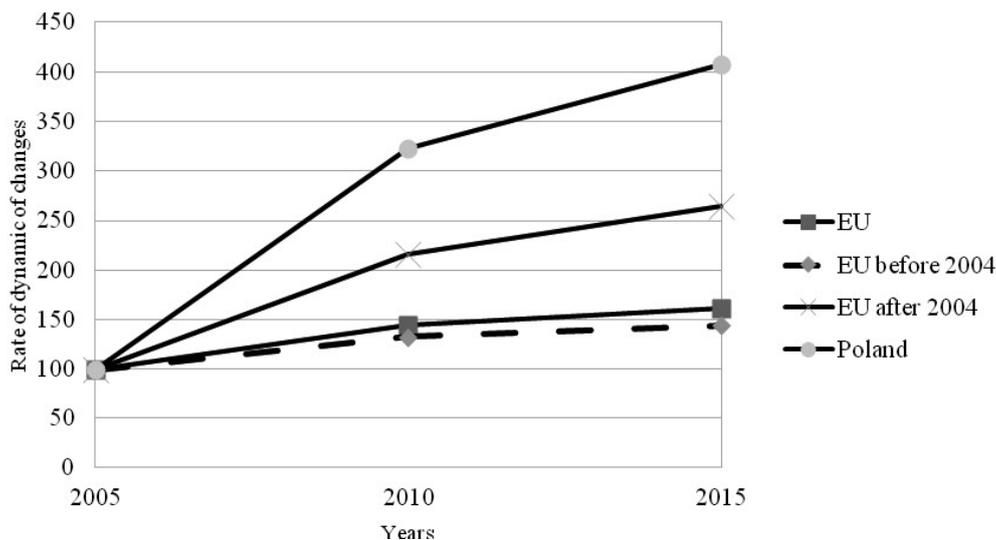
Specification/Years	2005	2010	2015
EU	100	100	100
EU before 2004	85,80	78,79	76,76
EU after 2004	14,20	21,21	23,24
Poland (in comparison to EU)	2,54	5,68	6,39
Poland (in comparison to EU after 2004)	17,88	26,78	27,51

Source: own study based on EUROSTAT

On the chart 2 dynamic of changes of area of organic farms was presented. In each researched group growing area of organic farms is observed. The intensity of growth of area of organic farms is differential in each group. The most intensive growth of area is observed in Poland (over 400% in 2015 in comparison to 2005). Slighter dynamic of growth is observed in group of members after

2004. Area of organic farms in this group grew by 265%. The smallest increase of area of organic farms is observed was recorded in group of old members of EU and in EU as a whole (about 150%).

Chart 2. The dynamic of changes of area of organic farms in specific groups in comparison to total area of EU (%)



Source: own study based on EUROSTAT

3. The forests

Forests similarly to the permanent pastures and meadows, are fulfilling many environmental functions. The process of afforestation is introducing new forests on agricultural land. Table 4. presents participation of area of forests in specified groups in comparison to total area of countries. In 2015 almost 36% of total area of the EU countries is covered by forests and the number was growing comparing to 2005 (almost 1% growth). Countries that joined the EU before 2004 are more forested than countries of the new EU (about 3% more in each analyzed year). Both in group of old members as in new members the trend of growing of forested area is observed. This trend is also observed in Poland but the share of area covered by forest is smaller than in EU generally (29,42% in 2005, 29,83% in 2010 and 30,17% in 2015).

Table 4. The participation of area of forests in specific groups in total area of each group of countries after 2004 (%)

Specification/Years	2005	2010	2015
EU	34,98	35,54	35,92
EU before 2004	35,96	36,54	36,88
EU after 2004	32,15	32,61	33,12
Poland	29,42	29,83	30,17

Source: own study based on EUROSTAT



Table 5. The participation of area of forests in specific groups in total forested area of EU countries after 2004 (%)

Specification/Years	2005	2010	2015
European Union	100,00	100,00	100,00
EU before 2004	76,53	76,56	76,45
EU after 2004	23,47	23,44	23,55
Poland (in comparison to the EU)	5,87	5,86	5,86
Poland (in comparison to EU after 2004)	25,00	25,00	24,89

Source: own study based on EUROSTAT

Table 5. contains data about participation of area of forests in specified groups in comparison to total forested area of EU countries. Majority of forested land is located in countries of EU-15 – over 76%. The rest of the forests is located in the new countries (about 24%). Area of Polish forests is about 6% of whole EU forested land and about 25% of forested land of the new members group.

The dynamic of changes of forested area was presented in table 6. In each researched group similar additive dynamic was observed. However, this growth is slight – about 3% in each analyzed group in whole studied period.

Table 6. The dynamic of changes of forested area in specific groups after 2004 (%)

Specification/Years	2005	2010	2015
European Union	100	101,58	102,66
EU before 2004	100	101,63	102,55
EU after 2004	100	101,44	103,02
Poland	100	101,40	102,55

Source: own study based on EUROSTAT

4. Natura 2000

According to the European Commission definition „Natura 2000 is a network of core breeding and resting sites for rare and threatened species, and some rare natural habitat types which are protected in their own right. It stretches across all 28 EU countries, both on land and at sea. The aim of the network is to ensure the long-term survival of Europe's most valuable and threatened species and habitats, listed under both the Birds Directive and the Habitats Directive” [Natura 2000 viewer].

In table 7. the share of area of Natura 2000 in total area of specific groups of countries in 2015 was presented. Data about area of special protection of birds and habitats were distinguished. Total area of Natura 2000 presented in column 4 is not sum of areas of birds and habitats protection because of overlapping of part of these protected areas. In countries of the EU over 18% of area is covered by Natura 2000 (including 12,84% of birds protection and 12,38% of habitats protection). Smaller share is observed between the old members of the EU (jointly 16,54%) and bigger – between new members (23,05%). In Poland there is 19,56% area of the state covered by Natura 2000 (including 10,93% area of birds protection and 15,84% area of habitat protection).

Table 7. The share of area of the Natura 2000 in total area of countries in 2015 (%)

Specification	Area of special protection of birds	Area of special protection of habitats	Natura 2000 total area
EU	13,84	12,38	18,12
EU before 2004	12,30	11,05	16,54
EU after 2004	16,95	17,07	23,05
Poland	10,93	15,48	19,56

Source: own study based on EUROSTAT

CONCLUSIONS

The analysis comes down to the following observations:

1. Area of permanent meadows and pastures in the European Union in researched period increased slightly. The most intensive dynamics was observed in group of the new EU members (after 2004).

2. Poland reflects general EU trend in area of permanent grassland and meadows – growth from 2005 to 2010 and slight decrease from 2010 to 2015.

3. Majority of permanent meadows and pastures is located in the old members state (over 75%). Less than a quarter of it is located on area of the new member states. Share of Polish grassland in its total area in EU is about 5,5% in whole period.

4. Poland is important producer of organic food in the EU. Number and area of organic farms in Poland is significant comparing to the EU. In 2015 more than 8% of farms were located in Poland and almost 6,5% of EU organic farming area is located in Poland.

5. Poland has also the greatest areas of organic farming among new EU members.

6. Area of organic farms in Poland in period from 2005 to 2015 increased fourfold.

7. Area of forests in countries of the EU is growing slowly. In 2015 the share in total area of the EU it was about 35%. In Poland area of forests also grows but is still smaller than average in the EU (which is about 30%).

8. The Natura 2000 is important method of environment protection. 18,12% of the EU is covered by the network. In the new EU it is more than 23% of area of the countries.

Observations pointed above lead to the conclusion that the environmental goals of sustainable development are implemented in field of agriculture. The EU and the state institutions by using economic, administrative and legal instruments make possible realization of this concept and its results are visible in all EU countries.

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