ANALYSIS OF THE CHANGE IN LITHUANIAN ORGANIC FARMING

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Abstract
The article contains information about the change in the country's landed property and areas occupied by farmers as well as the analysis of the change in organic farms and their areas in the Republic of Lithuania within the period from 2010 to 2014. The maximum and minimum areas of organic farming in municipalities as well as their change were determined for the detailed analysis.
Comparative, analytical as well as statistical and logical analysis methods were used for the investigation.
The aim of the investigation – to analyse the number of organic farms and the change in their occupied areas and to identify the reasons.
The object of the investigation – Lithuanian organic farms.
The analysis showed that in Lithuania within the period from 2010 to 2014 the number of organic farms decreased by 171, or by 6.53 percent. The largest number of organic farms was determined in Biržai, Ukmergė and Raseiniai district municipalities, the lowest – in Druskininkai, Rietavas and Kalvarija municipalities. Within the period from 2010 to 2014, the area of organic farming in Lithuania increased by 20481.65 hectares or by 12,45 percent. Out of 50 municipalities of the Republic of Lithuania, the areas of organic farming increased in 46 municipalities of the country, while the decrease in the areas of organic farming was observed in the six municipalities: Kėdainiai distr. (20.84 percent), Pakruojis distr. (16.45 percent), Pasvalys distr. municipality (40.16 percent), Šakiai (25.94 percent), Šiauliai (17.62 percent), Vilkaviškis (44.35 percent).
***Key words*:** organic farming, agricultural lands, certified organic farms.

Introduction

Because of the climate change and the negative impact of human activities on the environment, the restoration and conservation of agriculture-related ecosystem, soil erosion prevention and quality improvement are relevant and important topics.
Agriculture has changed. Food and fiber productivity soared due to new technologies, mechanization, increased chemical use, specialization and government policies that favored maximizing production. Although these changes have had many positive effects and redused many risks in farming, there have also been significant costs (Vellidis, Gattie, Smith, 2009).
Organic farming is an alternative activity to solve negative issues of the globalization process (Skulskis, Kairytė, Zemeckis, 2006). Thus, such farming is one of the measures implementing the sustainable farming goals, which are safe for the environment and the people.
Organic farming is important because conventional agriculture - which involves high-yielding plants, mechanized tillage, synthetic fertilizers and biocides - is so detrimental to the environment (Ivavičiūtė, 2014).
The aims of organic farming are to protect: the environment, by using organic management practices that do not have the adverse effects of conventional practices, and the health of consumers, by the provision of organic products (Argyropoulos et. al., 2013).
J. Čiulevičius, J. Kirstukas and R. Kripaitis (2007) define organic farming as a farm, where agricultural production meets all the existing environmental requirements. It is a farm that avoids using synthetic chemical fertilizers and pesticides: the plant demand for nutrients is met from natural organic sources, and the fight against disease and pests is carried out using natural organic materials and methods.
Organic farming in Europe has been developed since ancient times, however, in Lithuania it was launched only from 1990. For a decade several enthusiasts supported the idea of organic farming, and from 2000, after the state began to subsidize organic production, the attention increased in this trend of farming (Ekoagros, 2014).
Lithuanian scientists (I. Zableckis, R. Zemeckis, A. Dautartė, J. Pekarskas) conducted a study that evaluated the influence of the eligibility criteria and requirements for the support on the implementation of the program. During the study, the application of a mapping method enabled to determine distribution of applicants for agri-environment benefits in question as well as their declared landed property and crop in different areas of the country, and it was found that the highest concentrations of organic farms appear in less favoured areas, which are dominated by specialized

grain production. Since such a trend does not meet the principles of organic farming, it was suggested to promote the development of mixed farms in the future (FPP Consulting, 2014).
Organic farming in the EU is a system of agriculture and food production that combines favourable environmental and animal welfare standards and is supported by EU law (Regulations (EC) No 834/2007 and 889/2008/EC) (EUFIC Review, 2013).
EU and national government policies as well as their role in the development of organic farming are very important, i. e. public policy and financial support is regarded as one of the most important factors in promoting organic farms and their development (Skulskis, Stankaitytė, Daunytė, 2011). Continuing the Rural Development Programme for 2007-2013 "Organic Farming", rules on the implementation of the Lithuanian Rural Development Programme 2014-2020 measure "Organic Farming" were also approved (Lithuania ..., 2015).
However, I. Kriščiukaitienė and V. Namiotko (2013) pointed out that in Lithuania the problem arises from the fact that compensatory amounts are insufficient incentives to develop livestock farming and horticulture, to develop organic production throughout the farm and to increase the volume of organic production.
Researchers note that organic farming is fundamentally different from the traditional one (Padel, 2008), which is caused not only by differences in the quality of food, but also by different effects on the natural environment.
Sustainable development in agriculture – is an organic farming helping solve important problems in rural areas (Brazauskienė, 2002).
Most of the studies that compared biodiversity in organic and conventional farming demonstrated lower environmental impacts from organic farming. The key challenges in conventional farming are to improve soil quality (by versatile crop rotations and additions of organic material), recycle nutrients and enhance and protect biodiversity. In organic farming, the main challenges are to improve the nutrient management and increase yields. In order to reduce the environmental impacts of farming in Europe, research efforts and policies should be targeted to developing farming systems that produce high yields with low negative environmental impacts drawing on techniques from both organic and conventional systems (Tuomisto et. al., 2012).
Organic farming allows to practice old, environmentally friendly farming traditions, maintaining rural social structure and genuine agrarian landscape. The benefits of organic farming are obvious.
The object of the investigation – organic farms certified in Lithuania.
The aim of the investigation. To perform the change analysis of Lithuanian organic farms within the period form 2010 to 2014.
Tasks of the investigation:
1. To analyze the change in the landed property and declared farms within the period form 2010 to 2014.
2. To conduct the change analysis of Lithuanian organic farms and their areas.

Methodology of research and materials
Comparative, analytical as well as statistical and logical analysis methods were used for the investigation.
For the performance of the analysis, scientific articles, laws of the European Union and the Republic of Lithuania were examined. Significant benefits of organic farming for the environment, biodiversity, etc. were determined.
To fulfill the tasks set, the methods of data analysis, synthesis, comparison, graphing representation, data clustering were applied.
The analysis is based on the statistical data and information provided by Public Institution "Ekoagros", which are grouped in the article, compared and analysed on the national scale of the Republic of Lithuania and in individual municipalities. The mathematical calculations and their percentage expressions enabled to determine the change in the Lithuanian organic farms and its reasons.

Discussion and results
The analysis of the landed property and declared farms. Agricultural activities and environmental protection are inextricably linked. Agriculture is important for preserving the natural resources and agrarian landscape.
In 2014 the landed property occupied 3461942,22 ha, i. e. more than half of the territory of Lithuania (53 percent), agriculture-purpose area occupied 3941801,54 or 60,38 percent of the country area. In comparison with 2010, in 2014 the agricultural land area decreased by 12317,15 ha or 3,12 percent.

In the family farm register of Lithuania, 107308 family farms were registered in 2010, which occupied the area of 1040909,95 ha (26,32 percent of agricultural land). In 2014, the number of farmers in the register was 117457, and the total area of the used land comprised 1127039,15 ha. The comparison of the data of 2010 and 2014 reveals that within the four-year period the number of farmers increased by 10149, or 8,64 percent, and the used area – by 86129,20 ha or 7,64 percent.
In 2010 the declared landed property occupied 2053546,52 ha, while in 2014 – 2359467,84 ha, i. e. the area of the declared landed property of family farms increased by 305921,32 ha or 12,97 percent. The average area of the landed property per farm was 19,14 ha in 2010, and 20,09 ha in 2014.
It is important for the state to maintain the traditional landscape depending on farming, biodiversity, environmental cleanliness and nutrient balance needed for people to lead a healthy lifestyle and for the wildlife to thrive. Therefore it is necessary to encourage farmers to farm sustainably, to seek high quality in agriculture and livestock farms, to maintain healthy environment while expanding the area of organic farming.
However, since 2011 the number of organic farms was decreasing every year. During the period from 2010 to 2014, the number fell by 171, or 6,53 percent (Fig. 1).

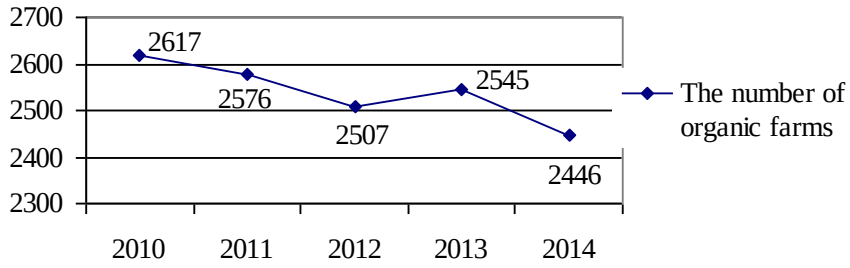

Fig. 1 Changes in the number of organic farms within the period form 2010 to 2014

The largest number of organic farms in 2010 was determined in Biržai district municipality (162 farms, or 6,19 percent of the total number of organic farms), Ukmergė district (140 farms or 5,35 per cent) and Raseiniai district (125 farms or 4,78 percent) municipalities. The least organic farms was in Druskininkai (7 farms), Rietavas (7 farms) and Kalvarija (9 farms) municipalities (Fig. 2).
In 2014 the largest number of organic farms was also determined in Biržai, Raseiniai and Ukmergė district municipalities. However, in Biržai distr. municipality the number of farmers fell by 23 farms (14,20 percent), in Ukmergė distr. - by 12 (8,57 percent), in Raseiniai distr. – by 40 (32 percent).
In 2014, just like in 2010, the least organic farms were in Druskininkai, Reitavas and Kalvarija municipalities, however, their number slightly increased: in Druskininkai and Kalvarija municipalities – by one organic farm, and in Rietavas - by three farms (Fig. 3).
The analysis revealed that more organic farmers are in the northern, eastern and western parts of the country and in less favoured areas. The number of organic farms fell due to violations of "The Rules of Organic Agriculture" identified during the inspection and non-compliance with organic farming requirements, which resulted in the cancellation of certificates.

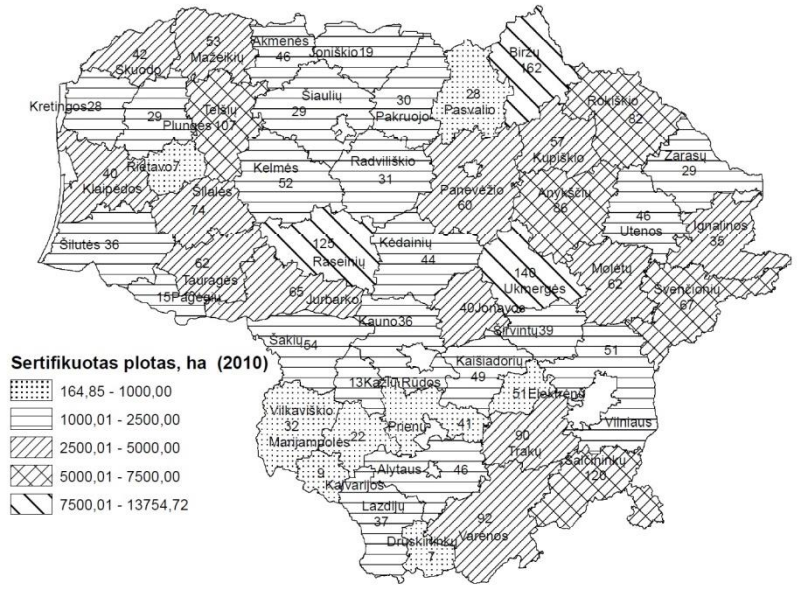

Fig. 2. Distribution of areas and numbers of certified organic farms in Lithuanian municipalities in 2010

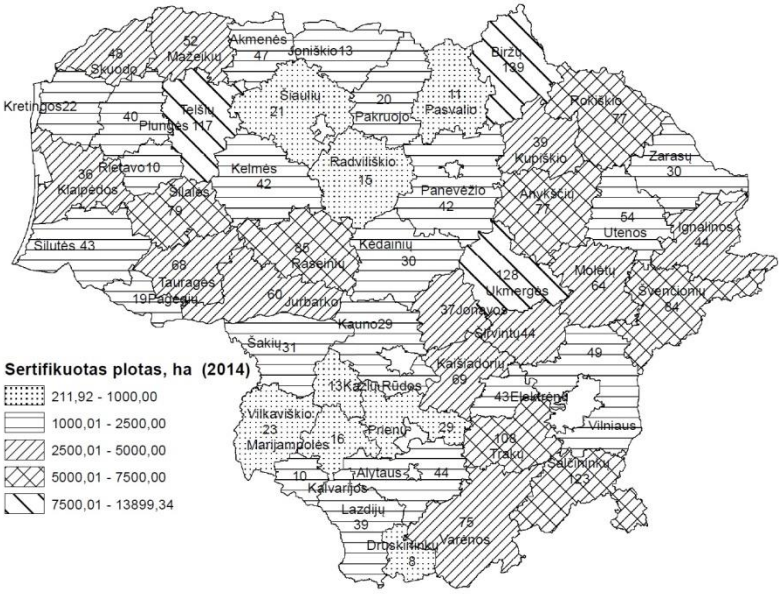

Fig. 3. Distribution of areas and numbers of certified organic farms in Lithuanian municipalities in 2014

In Lithuania organic farming areas are increasing. In 2010, organic farms comprised 4,16 percent of the country's landed property area and occupied 144006,23 ha. In 2014, after the increase in the area of organic farming, they comprised 4,75 percent of the total cultivated land. Although the above analysis shows that the number of organic farms is decreasing, however, the area of certified organic production is growing. During the period from 2010 to 2014, the area of organic farming in Lithuania increased by 20481.65 ha or 12.45 percent (Fig. 4).

It was determined that the average area of a certified organic farm in 2010 was 55.03 ha, and in 2014 – 67.25 ha, while the average landed property per farm in Lithuania in 2010 was 19.14 ha, and in 2014 – 20.09 ha. The analysis shows that the average area of organic farms is three times higher in comparison with average Lithuanian farm size.

The analysis of the change in areas of organic farms in Lithuanian municipalities within the period from 2010 to 2014 reveals that in 2010 the largest areas were in Biržai district municipality (13754,72 ha), i. e. 14.46 percent of the total municipal landed property, or 18.99 percent of utilized landed property area of the declared family farms. In Biržai district the area of an average organic farm comprised 84.91 ha. Within the period 2010-2014 the area of organic farms in the district municipality

increased by 144.62 ha or 1.04 percent, which occupied 13899.34 ha and comprised 14.62 percent of the municipal landed property, or 17.68 percent of utilized landed property area of the declared family farms. In 2014 the average area of an organic farm in Biržai district municipality was 100 ha. It was found that the number of organic farms in Biržai district municipality decreased in four years, however, the area – increased.

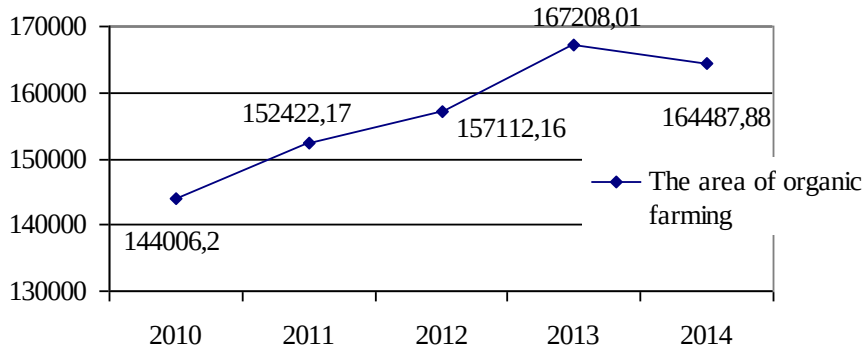

Fig. 4 Changes in the area of organic farming within the period form 2010 to 2014 in ha

In Ukmergė district municipality within the period from 2010 to 2014 the area of organic farms also increases by 931.96 ha or 9.35 percent. In 2010 farms under investigation occupied 9037.43 ha and comprised 12 percent of the total municipal landed property, or 19.68 percent of utilized landed property area of the declared family farms. The average area of a farm was 64,55 ha. In 2014 organic farms occupied 9969.39 ha, i. e. 13.24 percent of the total municipal landed property, or 18.51 percent of utilized landed property area of the declared family farms. In 2014 the average area of an organic farm was 77.89 ha. In Ukmergė district municipality, similarly to Biržai disrt. mun., the number of organic farms decreased, however, the area – increased.

In 2010 in Raseiniai district municipality organic farms occupied 6642.96 ha and comprised 6.6 of the total municipal landed property, or 9,21 percent of utilized landed property area of the declared family farms. The average area of a farm in 2010 was 53.14 ha. Within the period 2010-2014 the number of organic farms in the municipality increased by 576.97 ha or 7.99 percent and occupied the area of 7219.93 ha, which comprised 7.18 of the total municipal landed property, or 9.20 percent of utilized landed property area of the declared family farms. In 2014 the average area of farms in question was 84.94 ha. Thus the research reveals that within the period 2010-2014 the number of organic farms decreased by 40, however, the area increased by 8 percent in Raseiniai district municipality.

The analysis of the change in organic farming areas within the period 2010-2014 revealed that the areas of organic farming decreased in six municipalities out of 60 municipalities of the Republic of Lithuania: in Kėdainiai distr. municipality the area of organic farming dropped by 503.82 ha or 20.84 percent. In Pakruojis distr. municipality the area decreased by 214.94 ha or 16.45 percent, in Pasvalys distr. mun. – by 366.76 ha (40,16 percent), in Šakiai distr. mun. – by 561.4 ha or 25.94 percent, in Šiauliai distr. mun. – by 200.53 ha (17,62 percent), in Vilkaviškis distr. mun. – by 378.47 ha or 44.35 percent. In Lithuania the largest area of organic farming decreased within the period 2010-2014 was determined in distr. mun. (561.4 ha).

It should be noted that within the period 2010-2014 areas of organic farming increasing in 46 municipalities of the state, the development occurred because of the end of transitional period and the validation of certified organic farm areas.

In Lithuania, organic farming is becoming increasingly popular. Their development results in the reduction of environmental pollution, preservation of biodiversity, with the aim to at least partially reduce poor soil areas, to ensure food safety, the improve landscapes which are relevant not only to the environment and living organisms, but can also provide greater socio-economic benefits. In the production process of organic farming, more work needs to be done manually, in contrast to the intensive production farming, therefore this kind of work requires more workers, which promotes the small farming and the employment of people in rural areas.

Conclusions

1. In 2014, the landed property in the Republic of Lithuania occupied 3461942.22 ha, i. e. more than half of the state area (53 percent), the agricultural land occupied 3941801.54 ha, or 60.38 percent of the total state area. Within the period from 2010 to 2014 the agricultural land decreased by 12317.15 ha, or 3.12 percent, however, the number of farmers over the period of four years increased by 10149, or 8.64 percent, and their occupied area increased by 86129.20 ha, or 7.64 percent. The declared landed property of family farms increased by 305921.32 ha, or 12.97 percent. An average area of landed property per farmer in 2010 comprised 19.14 ha, while in 2014 it was 20.09 ha.
2. In the period 2010-2014, the largest number of organic farms was determined in Biržai, Ukmergė and Raseiniai district municipalities, the lowest number of organic farms was found in Druskininkai, Rietavas and Kalvarija municipalities. In Lithuania within the period from 2010 to 2014 the number of organic farms decreased by 171 or 6.53 percent. The number of organic farms fell because of irregularities and non-compliance with the requirements of organic farming identified during inspection.
3. Within the period from 2010 to 2014 the area of organic farms in Lithuania increased by 20481.65 ha, or 12.45 percent. The average area of a certified organic farm in 2010 comprised 55.03 ha, and in 2014 it was 67.25 ha, while the average area of landed property per farmer in Lithuania in 2010 comprised 19.14 ha, and in 2014 it was 20.09 ha.
4. The analysis of the change in organic farming areas in Lithuanian municipalities within the period from 2010 to 2014 revealed that the largest area was situated in Biržai distr. municipality and increased by 144.62 ha, or 1.04 percent, and in 2014 it occupied the area of 13899.34 ha, the average area of an organic farm was 100 ha. In Ukmergė distr. municipality within the period from 2010 to 2014 the area of organic farms increased by 931.96 ha, or 9.35 percent, and in 2014 it occupied 9969.39 ha, the average area of an organic farm was 77.89 ha. In Raseiniai distr. municipality within the period from 2010 to 2014 the area of organic farms increased by 576.97 ha, or 8 percent, however, the number of organic farms decreased by 40.
5. The analysis of the change in organic farming areas within the period from 2010 to 2014 revealed that out of 50 municipalities of the Republic of Lithuania, the areas of organic farming decreased in 6 municipalities of the country: Kėdainiai distr. (503.82 ha, or 20.84 percent), Pakruojis distr. (214.94 ha, or 16.45 percent), Pasvalys distr. municipality (366.76 ha, or 40.16 percent), Šakiai (561.4 ha, or 25.94 percent), Šiauliai (200.53 ha, or 17.62 percent), Vilkaviškis (378.47 ha, or 44.35 percent). Within the period from 2010 to 2014 the areas of organic farming increased in 46 municipalities of the state, the development occurred because of the end of transitional period and the validation of certified organic farm areas.

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