

THE CURRENT SITUATION ANALYSIS AND ECOLOGICAL FARMING IN THE AUKŠTADVARIS REGIONAL PARK

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Abstract

The analysis of the current situation of Aukštadvaris Regional Park and ecological farming (RP), which is in southeastern Lithuania, is presented in the article. The Paluknys subdistrict was chosen for the comparison of the use of ecological farming in the regional park. Ecological farming is relevant to protected areas. The aim of the study was to perform the analysis of farms applying organic farming measures as well as the analysis of the change of their areas in Aukštadvaris regional park (RP). Comparative, analytical as well as statistical and logical analysis methods were used for the investigation. The object of the investigation - the farms of Aukštadvaris Regional Park. The study was carried out to determine how many farms, forming the territory of the regional parks, are managed according to the principles of organic farming. The change of the above-mentioned farming area for 2011-2013 is analyzed as well. Paluknys subdistrict, not incorporated into the territory of regional parks, was chosen for the comparative analysis.

The analysis of the 2011-2013 period showed that the number of organic farms increased by 1.5 times in Aukštadvaris RP over the period of 2011-2013, and the area has increased by 187.36 ha. The percentage calculations revealed that in 2013 the area of farms applying organic farming measures in Aukštadvaris RP made up 18.89 per cent of the total area declared, the number of farms - 6.61 per cent.

Key words: regional park, agricultural lands, ecological farming measures, declared areas.

Introduction

Protected areas throughout the world are the key for preserving biodiversity, and land use is the key for providing food, fiber, and other ecosystem services essential for human sustenance. As land use change isolates protected areas from their surrounding landscapes, the challenge is to identify management opportunities that maintain ecological function while minimizing restrictions on human land use (DeFries et. al., 2007).

The aim of protected areas is to preserve natural habitats and species (common on agricultural land) of the European Community interest. Such rate of the conservation and use of treatment of the territory is determined that non-intensive farming, forming natural values, should not be interrupted and should be continued in environmentally-friendly manner. If the extensive farming is not carried out in natural grasslands, pastures and wetlands, such areas will overgrow with shrubs, trees and biodiversity would face the biggest threat. As a result, only those activities are limited which could suddenly and irreversibly destroy natural values, for example, grassland ploughing, drainage works, liming, fertilizers and so on.

So, 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). Protected areas are necessary to comply with the principles of sustainable farming, expansion of area under organic farming and organic farming for measures to preserve the landscape, the importance of biodiversity, natural and cultural heritage values (Ivavičiūtė, Gurskienė, 2010). Ecological farming and environmental measures are very important for the sensitive and vulnerable plant and animal species and habitats. The intensification and expansion of modern agriculture is amongst the greatest current threats to worldwide biodiversity (Hole et al., 2005). Sustainable development in agriculture – is an organic farming helping solve important problems in rural areas (Brazauskienė, 2002).

Most protected areas require the cooperation and support of local communities and an understanding of stakeholder values and perspectives (Tanner-McAllister, Rhodes, Hockings, 2014).

So, farming in protected areas is difficult, because faced with environmental and economic problems. Protected areas are divided into zones, which are subject to different restrictions of economic activity, and therefore economic activity differs as well.

The object of the research - the farms of Aukštadvaris Regional Park.

The aim of the research is to carry out the comparative analysis of the years 2011 and 2013 of farms applying organic farming measures as well as the analysis of the change of their areas.

Tasks of the research:

1. To carry out the analysis of the current situation of the Aukštadvaris Regional Park.
2. To perform the analysis of farms of Aukštadvaris RP and Paluknys subdistrict applying organic farming measures as well as the analysis of the change of their areas.

Methodology of research and materials

Comparative, analytical as well as statistical and logical analysis methods were used for the investigation. The analysis of the areas declared in the Aukštadvaris Regional Park and the Paluknys subdistrict was carried out following the data of the Agriculture Information and Rural Business Center on the declared agricultural land areas.

The survey was conducted to determine whether environmental measures for the Aukštadvaris regional park and the Paluknys subdistrict differ because of the restrictions and recommendations (on the regional parks) to protect and enhance biodiversity, promote environmentally friendly farming methods and organic farming measures.

The study is carried out to determine how many farmers' farms, forming regional parks' territory, apply organic farming measures. The change of above farms' area for 2011-2013 is analyzed as well. Paluknys subdistricts, not incorporated into the territory of regional parks, were chosen for the performance of the comparative analysis.

Discussion and results

The current situation analysis of Aukštadvaris Regional Park. Aukštadvaris Regional Park is situated in southeastern Lithuania, in the most remarkable part of the Dzūkai upland. Aukštadvaris RP is situated in the medium potential recreational area Aukštadvaris-Daugai (Pileckas, Gulbinas, 2004). Almost entire territory is situated in Trakai district.

When the government of the Republic of Lithuania had approved the plan of the buffer and protection zones of Aukštadvaris Regional Park and its zones on March, 9, 2005, the area of Aukštadvaris regional park increased by 482 ha (according to the new plan) and at present covers the area of 17,032.43 ha. After the changes, the largest area is occupied by the functional priority zone – the territory of conservation priority zone - reserve covering 44.20 percent (10,551.10 ha) of the whole park's territory, and the ecological protection priority zone, covering 16.47 percent (3,932.69 ha) of the whole park's territory. There are 15 reserves in Aukštadvaris Regional Park. The largest reserves in the park - Mergiškiai (2138.10 ha) and Verknė (1972.71 ha) landscape reserves, the Moša archaeological reserve (9.49 ha) occupies the smallest area.

The smallest area is occupied by the functional priority zone - the territory of reservation covering 0.66 percent or 156.39 ha. The living zone occupied 225.32 ha (0.94 percent), recreational priority zone covering 6.18 percent or 1474.29 ha. The area of the buffer protection zones of Aukštadvaris RP covering 28.65 percent (6839.62 ha).

The average efficiency of the agricultural lands in Trakai district is 33.4 points, i.e. is smaller than the average point of the Republic of Lithuania (39.1). The agricultural lands in Aukštadvaris RP make up 38.09 percent of the whole park's territory (Raudonytė, 2009). The efficiency score in the Regional Park is larger than in Trakai district, but lower compared to the national average.

Forests cover the largest part of agricultural lands (51.12 percent). They are divided into forest massives 100-1700 ha each. Park forests are very different (from the point of view of types, age, etc.). Pine-trees, birches, oaks, hornbeams grow in these forests (Aukštadvario..., 2013).

No forests have been planted in Aukštadvaris Regional Park during 2011-2012. In 2012, three requests for afforestation were considered, however, they were not satisfied. Nine requests for forest planting were considered in 2013. Four requests for the afforested in 5.378 ha area were rejected, but five requests for afforestation in 5.56 ha of forest area were satisfied (Aukštadvario..., 2014 a).

The aim was to preserve the open landscape spaces in the Regional Park, therefore new forests should not be planted in landscape reserves and other areas distinguished by expressive landscape, as well as in valuable areas from botanical and zoological point of view, near observation decks, tourism objects and picturesque hiking trails (Aukštadvario..., 2014 b).

Agricultural land in the park makes up 38.09 per cent. Agricultural activity in the Regional Park is less cost-effective due to not very fertile soils and difficult terrain. Part of the land is abandoned, overgrown with high grasslands, shrubs and trees – which results in the disappearing of protected traditional landscape, valuable grassland and wetland habitats. More support is needed in less-favored for farming areas, for meadows and wetland habitat management.

Water reservoirs make up 7.63 per cent, swamps – 0.55 percent. (Fig. 1). The park has 89 lakes and ponds (Pileckas, Gulbinas, 2004).

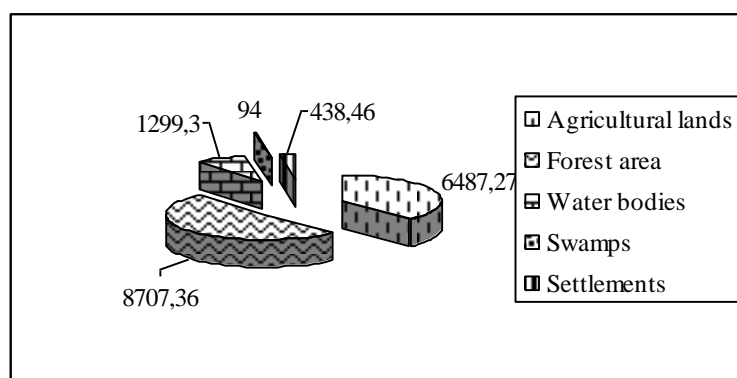


Fig. 1. Distribution of agricultural lands in the Aukštadvaris regional park, in ha

Settlements in Aukštadvaris RP occupy 438.46 hectares and make up 2.57 per cent of the park's territory. There are 100 villages in the Regional Park (the largest – Čižiūnai with about 180 inhabitants), Aukštadvaris town has 1,000 inhabitants (Aukštadvario..., 2014 b).

In 2014, the number of farmsteads of towns, villages and steadings situated in Aukštadvaris Regional Park – 1,322 pcs. and 2,729 residents. The number of abandoned, unused buildings in the regional park, spoiling the environment, is 16 pcs., however, none of the above buildings has been removed since 2005.

The number of violations of the joint landscape protection requirements in Aukštadvaris Regional Park varies slightly. The majority of violations were recorded in 2005 - 16 cases. The minority of violations were recorded in 2013 - 2 cases. Unauthorized constructions and reconstructions mainly were recorded in 2006 - 9 cases, no unauthorized constructions and reconstructions were observed in 2010-2013. There were 2 cases of other landscape violations observed in 2006 and 2013, in 2012 -15 cases. The non-compliance of the project was observed only in isolated cases.

Having performed the landscape change analysis of Aukštadvaris town, which is part of the regional park, the most obvious change was highlighted in a northeasterly direction. The photofixation method was used for the performance of the change analysis. The fixation in the park takes place twice a year. It was found that the development of new constructions goes on according to the Aukštadvaris Regional Park Management Plan approved in 2005. The biggest changes in the landscape (the overgrowth with naturally growing trees) occurred in farm and ecological protection priority zones.

Other land occupies 6.04 hectares and makes up 12.04 per cent in Aukštadvaris Regional Park. There were three damaged areas in the analyzed Regional Park in 2005: Aukštadvaris dump (0.25 ha), a former gravel quarry in Gedanonys village (0.3 ha), a former gravel quarry in Pakalninkai village (0.05 ha). For the time being, there is only one remaining damaged area: the former gravel quarry in Pakalninkai village.

27 territories in the Aukštadvaris RP correspond to the criteria of the habitats of European importance. There are over 100 objects of cultural heritage in Aukštadvaris regional park (RP): 39 archeological places, 33 places of interment, 20 mythological places, over 20 valuable constructions and paraphernalia and urbanized localities (Aukštadvario..., 2013).

The system of protected natural heritage sites in the regional park is not formed yet. Although the regional park has geological, geomorphological and hydrogeological objects abundance, very few have been announced as protected ones. The natural heritage sites condition in Aukštadvaris Regional Park varies little. In 2005, the good condition sites amounted to 37.9 per cent., the average state sites - 44.8 per cent., the poor condition sites - 17.3 percent. In 2013, the number of sites in good condition has increased and amounted to 63.2 per cent, the number of natural heritage sites of the average state has dropped to 31.6 per cent, the number of natural heritage sites of the poor condition also declined to 5.2 per cent. Thus, when evaluating the state of the Aukštadvaris RP natural heritage sites it was found that in 2005-2013 the number of natural heritage sites in good condition has increased by 25.3 per cent, the number of the sites in average condition decreased by 13.2 per cent, and the number of the natural heritage sites in poor condition decreased by 12.1 per cent (Aukštadvario..., 2014 b).

Ecological farming in Aukštadvaris and in Paluknys subdistrict. The performed comparative analysis of the declared farmers' farms areas in Aukštadvaris RP shows that the total farmers' farms area decreased by 1058.13 ha (Fig. 2) and the number of those declaring their farms decreased by 142 farms.

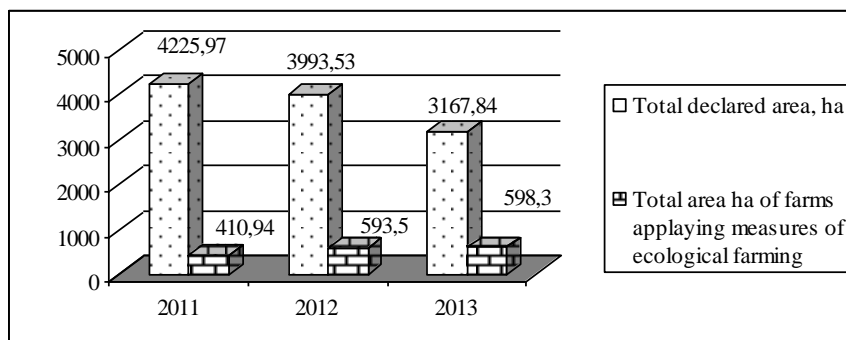


Fig. 2. Analysis of the declared areas change in Aukštadvaris RP during the period of 2011-2013

In 2011, the total area of declared farms made up 24.81 per cent of the total Aukštadvaris RP area, in 2012 – 23.45 per cent, in 2013 – 18.16 per cent.

The number and area of farmers' farms applying organic farming measures increased each year (Fig. 3). In 2011, these measures were applied by 3.47 per cent of the declared farmers in the 410.94 ha area, and it made up 9.72 per cent of the total area declared and only 6.33 per cent from RP's agricultural land area. In 2013 6.61 per cent of farmers applied organic farming measures in the area of 598.3 ha (18.89 per cent of the total area declared and 22.9 per cent from the RP's agricultural area). So, the number of organic farms increased by 1.5 times in Aukštadvaris RP over the period of 2009-2011, and the area has increased by 187.36 ha.

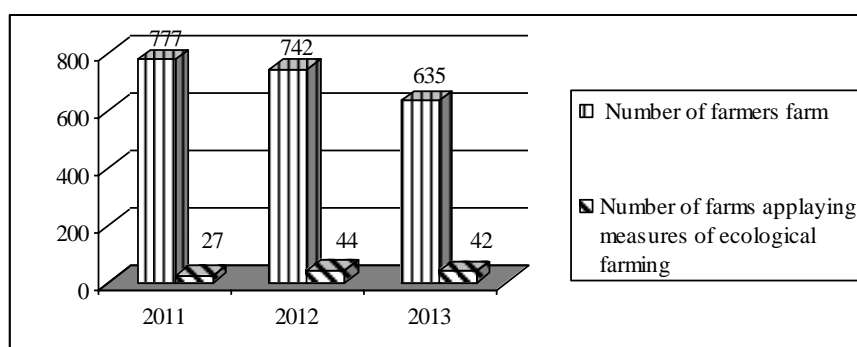


Fig. 3. Analysis of the number of farmers farm applying measures of ecological farming in Aukštadvaris RP during the period of 2011-2013

Paluknys subdistrict, situated in the southeastern part of the Trakai district, outside the territory of Aukštadvaris RP, was chosen for the comparison of the use of ecological farming in Aukštadvaris Regional Park. The territory covers the area of approximately 14 thousand ha. A part of the inhabitants upholds the traditional agriculture.

The average efficiency of the agricultural lands in Paluknys subdistrict is 31.8 points.

In Paluknys subdistrict, unlike Aukštadvaris RP, the total area declared gradually increased for the period of 2011-2013 (Fig. 4), but the number of farms, which have submitted declarations, decreased by 19 farms. Only one farmer applied organic farming measures in the analyzed municipality in 2011 in the area of 11.85 ha. It made up 0.53 per cent of the total area declared.

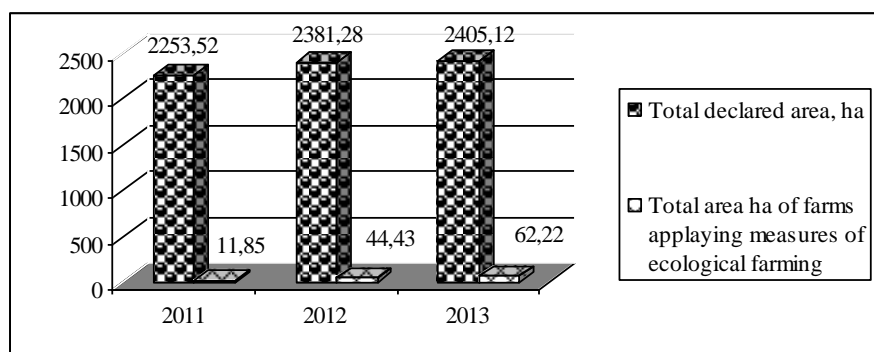


Fig. 4. Analysis of the declared areas change in Paluknys subdistrict during the period of 2011-2013

The number farms applying these measures, rose slightly - by one during one year period (Fig. 5), and the area has increased to 66.22 ha and made up 2.59 per cent of the total area declared. So, the number of organic farms in Paluknys subdistrict increased almost 6 times or by 50.37 ha in 2009-2011.

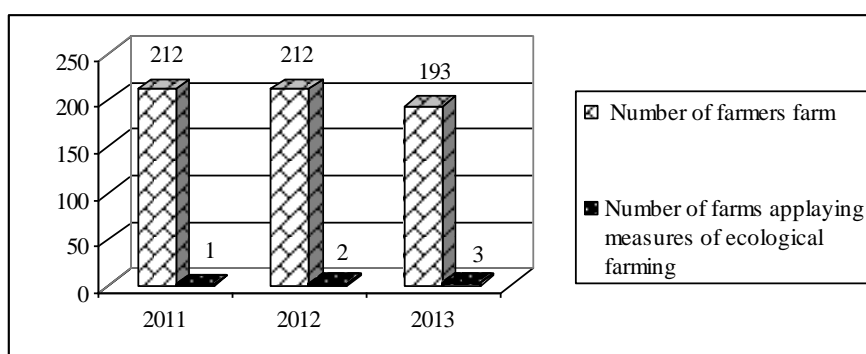


Fig. 5. Analysis of the number of farmers farm applying measures of ecological farming in Paluknys subdistrict during the period of 2011-2013

The analysis of Aukštadvaris RP and the Paluknys subdistrict (which is not incorporated into the park's territory) of 2011-2013 showed that organic farming has been introduced at the number of farms and the area has increased. The percentage calculations revealed that in 2013 that the area of farms applying organic farming measures in Aukštadvaris RP made up 18.89 per cent of the total area declared, the number of farms - 6.61 per cent. In Paluknys subdistrict - 2.59 and 1.55 per cent, respectively.

Organic farming, clearly a viable option in many situations, is still not fully exploited and is not widespread in protected areas. Organic farming is important because conventional agriculture - which involves high-yielding plants, mechanized tillage, synthetic fertilizers and biocides - is so detrimental to the environment.

Conclusions

1. The largest area of Aukštadvaris RP is occupied by the functional priority zone – the territory of conservation priority zone – reserve covering 44.20 percent (10,551.10 ha) of the whole park's territory, and the ecological protection priority zone, covering 16.47 percent (3,932.69 ha) of the whole park's territory.
2. The number of organic farms increased by 1.5 times in Aukštadvaris RP over the period of 2011-2013, and the area has increased by 187.36 ha. The number of organic farms in Paluknys subdistrict increased almost 6 times or by 50.37 ha in 2011-2013.
3. The percentage calculations revealed that in 2013 the area of farms using organic farming methods in Aukštadvaris RP made up 18.89 per cent of the total area declared, the number of farms - 6.61 per cent. In Paluknys subdistrict - 2.59 and 1.55 per cent, respectively.
4. It is recommended to develop animal-breeding as well as ecological farming for the improvement of the condition of environment and landscape in Aukštadvaris Regional Park. It is necessary to form clear and sufficient policy over the compensation for the restrictions of the farming in protected areas, which should reduce the load of ordinary economic activity in protected areas, and their usage should become more favorable for protected valuables.

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