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THE CHANGE OF NATURAL LANDSCAPE IN PALANGA CITY (LITHUANIA)

Giedrė IVAVIČIŪTĖ, Vytautas Magnus University, Universiteto g. 10, LT – 53361 Akademija, Kauno raj. / Kaunas Forestry and Environmental Engineering University of Applied Sciences / Klaipėda State University of Applied Sciences, ivavice@gmail.com

The paper presents the comparative analysis of the Palanga city landscape change during the period between 2008 and 2019. For this analysis, the land fund statistics of the Republic of Lithuania, which had been grouped into a relatively natural and anthropogenic landscape, were used. Landscape change is graphically shown in the figures. Lithuanian and foreign scientific literature and legal acts were analyzed for the fulfillment of the work. The Palanga city landscape analysis of the current situation was done. During the analysis the Palanga city statistics were compared with the data of Klaipėda County and the Republic of Lithuania.

Landscape structure maintenance is the subject important and relevant to this day, as the landscape shapes the country's culture and is the component of natural and cultural heritage contributing to the quality of life and it consolidates Lithuanian identity, uniqueness in Europe and the world. The topic is actual because it is necessary to analyze landscape change in Palanga in order to evaluate and preserve the components of natural landscape in Lithuanian resort.

The analysis showed that during the analyzed period the Palanga city natural landscape area 46.34 ha or 1.39 percent. The increase of the natural landscape area was determined by the development of water bodies and wetland areas.

Keywords: *components, landscape change, natural landscape.*

INTRODUCTION

The problem. During the period of intensive urbanization in Lithuania, as well as in the country resorts, the areas of the natural landscape are decreasing.

The object of the investigation. Natural landscape in Palanga City.

The aim of the investigation is to carry out the analysis of the changes in Palanga City natural landscape during the period between 2008 and 2019.

Goals of the research:

1. To describe the current situation of natural landscape of Palanga city.
2. To examine the Changes of components of natural landscape in Palanga.
3. To analyse the changes in Palanga city natural landscape during the period between 2008 and 2019.

European Landscape Convention (European, 2000) describes the landscape as people perceived area, as determined by the nature and (or) the factors of human action and interaction.

Landscape is a natural and pulsating natural and anthropogenic system, undergoing complex changes, which can be divided into two groups corresponding to two directions of change – naturalization and anthropogenization. These two groups of forces change the landscape in the eyes of modern mankind (Pranckietis et al., 2010).

Natural frame in Lithuania amounts to 61.4 percent of the whole territory of the country and it represents a large proportion of natural and semi-natural areas (Mieliauskas, 2012).

The future of most landscapes is increasingly being determined by human activities. These activities modify existing landscape patterns and processes either deliberately or inadvertently (Hobbs, 1997).

However, anthropogenisation affects the natural landscape, so the expansion of cities, its areas are decreasing and components are vulnerable. Thus, the landscape changes are connected with urban sprawl, the change in urban and natural areas ratio, landscape condition (from psychoecological point of view) (Ivaviciute, 2016).

The impacts of natural landscape changes are: climate change, land use - land cover change and urbanization. Variations in climate are one cause, but there are other "drivers," too, such as volcanic eruptions, coastal erosion, floods, fires, and earthquakes (Berger, 2008).

Climate change will affect the way humans use landscapes. Interactions among these drivers of ecosystem change can have destabilizing and accelerating feedback, with consequences for human societies. These challenges require landscape ecologist to engage policymakers and practitioners in seeking long-term solutions, informed by an understanding of opportunities to mitigate the impacts of anthropogenic drivers on ecosystems and adapt to new ecological realities (Mayer et al, 2016).

It is complicated to explore Landscape because landscape analysis involves the assessment of features of a landscape in relation to any of a group of factors such as land use change; shifts in hydrology, forest harvest, or other

disturbance; topography; historical vegetation conditions; past and potential future climate change; and other factors (Kennedy, 2019).

Adapting research practice to match integration opportunities within social-ecological systems could contribute foresight capabilities emerging from landscape change studies, which can be coupled with emerging policy transformation opportunities. Creating future options redundancy plans, a variety of possible pathways and alternative landscape futures within the characteristics and capacity of a region, could facilitate policy shifts and adaptive capacity, and reduce risk through reflexive future options (Brunckhorst et al, 2017).

RESEARCH METHODS

Comparative, analytical as well as statistical and logical analysis methods were used for the research.

The article analyzed Lithuanian and foreign scientific literature. The collected material was analyzed, systematized and generalized.

The land fund statistics of the Republic of Lithuania (Nacionalinė žemės..., 2008–2019), graphically depicted in figures, were used for the fulfilment of the research of the Palanga city natural landscape change for the years 2008–2019.

During the analysis the Palanga city statistics were compared with the data of Klaipėda County and the Republic of Lithuania.

The paper presents the current situation of Palanga city landscape, the change of components of natural landscape and natural landscape change for the years 2008–2019.

RESULTS OF RESEARCH

The current situation of Palanga City landscape

Palanga city is located in the northwest of Lithuania, in the territory of Klaipėda County. The city borders the Republic of Latvia in the north, the Kretinga and Klaipėda districts in the east, and the Baltic Sea in the west. It is one of the largest Lithuanian resorts and tourist centers, already half way through the second century of recreational activities.

Palanga is a climatic and balneological resort by the Baltic Sea, 25 km north of Klaipėda. Palanga, as a resort, became famous in the early 19th century. In the beginning, these were the "sea bathing places", which were visited by wealthy holidaymakers from Gudija, Vilnius and elsewhere during the summer. The resort became most famous when in 1829 Palanga estate was bought by Count Mykolas Tiškevičius. Count Tiškevičius ruled Palanga (Palanga County) for 116 years. The resort grew most rapidly after 1891, when Feliksas Tiškevičius became the owner of Palanga Manor, when he started building new palaces. In 1897, after the completion of the palace, the park began to be built, which is recognized as one of the most beautiful parks not only in Samogitia (Žemaitija), but in the whole Lithuania as well. The park was designed by French landscape architect Eduard Fransua Andre.

At the end of the 19th century not only wealthy Poles and Jews from abroad came to Palanga, but also many Lithuanian people of art, science and culture (Mukienė, 2010).

Today, Palanga is an international active seaside resort focused on spa treatment and entertainment and has a developed service infrastructure (Kriščiūnas, 2005). Palanga is a climatic, balneological and mud therapy resort of national importance (Palanga, 2019). The city is famous for its natural mineral water, curative clay, iodine-saturated pine air.

The northern part of Palanga belongs to the Seaside Regional Park, in which the Plazė Nature Reserve, the Nemirseta Landscape Reserve, part of the Šaipiai Landscape Reserve and a small part of the Karklė Marine Reserve are located. In the municipality, there is the Būtingė Geomorphological Reserve, the Būtingė Bird Mire Ornithological Reserve and the natural monument Būtingė Oak.

Nemirseta, which is incorporated into the Conservation Area of the Seaside Regional Park, is distinguished by the landscape characteristic to the Lithuanian seaside: a sandy protective beachfront coffin and large vegetation typical only for the Lithuanian seaside. From the old dunes, there are magnificent views of the new ones, below which is the sea.

From a natural standpoint, the most interesting stretch of coastline is about 200 m wide, comprising strips of beaches, sand dunes and pine forests. The two most famous dunes in Palanga are Birutė and Naglis mountains.

Special recreational areas of the Seaside Regional Park, Nemirseta Landscape Reserve, Plazė Nature Reserve are identified as major or regional urban green areas in the Master Plan of Palanga city (Savivaldybės įmonė..., 2008).

Palanga resort is globally divided into three zones (Savivaldybės įmonė..., 2006):

1. Recreational areas used by residents and holidaymakers (aquatic areas);
2. Urbanized residential, recreational, utility and infrastructure areas;
3. Potential recreational areas of forests, meadows and other green areas.

The municipal area is divided into four zones of linear structure in north-south direction.

In 2019, the city municipality occupies an area of 7918.80 hectares and makes up 1.52 percent of the Klaipėda County territory. In 2019, the largest part of the municipality consisted of forests (39.21 percent), the smallest – of roads (2.86 percent) (Fig.1).

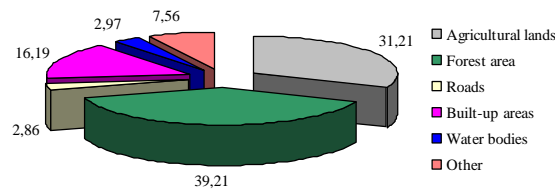


Figure 1. Percentage distribution of land use in the city of Palanga in 2019

The modern Palanga resort is the result of the formation of a seaside settlement, port, town, city in the historical space (Jankauskaitė, 2016).

The components of natural landscape and their change of area

This chapter explores the components of the relatively natural landscape: forests, waters and wetlands. The analysis of these components from the period of the years 2007-2019 is being presented.

Forests. Palanga forests perform protective, stabilizing and compensatory functions and maintain the ecological balance of the city. Although viable and of good species composition, forests are poorly adapted to the recreational needs of townspeople and visitors.

In Palanga municipality there are the following forests: Nemirseta, Palanga, Būtingė, Padarbio, Forest Seaside Dunes, Vilimiškė and Forest Paliėgiriai peatland.

In 2008, forests in Palanga occupied 3158.5 ha, during the period between the years 2008 and 2019, forest area decreased by 53.68 ha or 1.70 percent and in 2019 accounted for 39.21 percent of municipality area (Fig. 2), where Klaipėda County forests accounted for 26.25% and national forests - 33.07%.

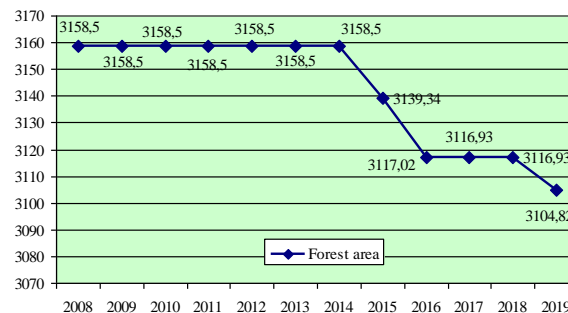


Figure 2. Forest area change in Palanga City in 2008-2019 (consisted by author of the article according to (Nacionalinė žemės..., 2008 – 2019)

The figure shows that forest areas were started to be cut in 2015, with public needs being redefined. For example, in 2017, the Palanga City Municipal Council adopted a decision approving the special plan for the architectural-urban system and landscape management of the Kunigiškės area. The plan provides for the removal of 1.9 hectares of forest of national importance and the establishment of about 400 parking spaces.

Initially, it was planned to cut an area of approximately 0.9 ha, with a total of 616 mature pines, and the area of deforestation subsequently increased.

The resort also identified tree destruction cases that damaged healthy trees near Mount Naglis. In two private plots, 171 trees were poisoned through holes drilled in the trunks and injected with chemicals. The damage to the landscape is estimated at 46,623 Eur (Nikitenka, 2018).

In Klaipėda County, as in Palanga, the forest area decreased by 71.80 ha or 0.05%. In the Republic of Lithuania, during the period of 2008 – 2019, forest area increased by 38486.53 ha or 2.82 percent.

The analysis shows that although the development of forest areas is taking place on the whole of Lithuania, the forest areas in Klaipėda County and Palanga city municipality are being reduced.

The water bodies. The western edge of the resort is washed by the Baltic Sea, in the north, in the Šventoji settlement, the Šventoji River flows into the Baltic Sea. The Ražė River flows through the city to the west, where 10 bridges have been built (Palanga, 2019).

Palanga City Municipality Master Plan (Savivaldybės įmonė..., 2008) mentions the main formants of Palanga's natural frame: the Baltic Sea, beach and front stretches, Palanga Manor Park, the Ražė and Šventoji Rivers – migration corridors.

Palanga resort stretches about 24 kilometers along the Baltic coast. In Lithuania, the Šventoji and Ražė Rivers as well as several streams flow directly into the Baltic Sea.

The following water bodies are found in Palanga city municipality: River Darba, River Žiba, River Ražė, Anaičiai Lake, Kunigiškės Pond.

In the Palanga municipality during the period between the years 2008 and 2019, the area of water bodies increased by 89.46 ha or 61.44 percent; occupied 235.06 ha and made up 2.97 percent of the total municipal area (Fig. 3).

Meanwhile, the area of water bodies in Klaipėda County in 2008-2019 increased by 1551.20 ha or 2.91 percent, in the country – 3404.35 ha or 1.30 percent.

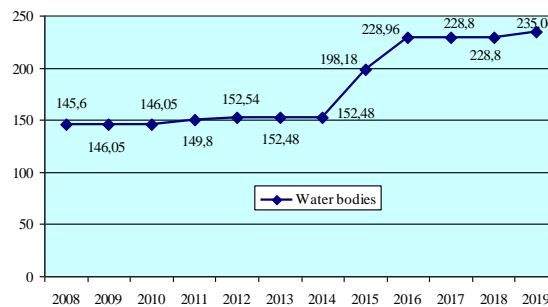


Figure 3. Water bodies change in Palanga City in 2008-2019 (consisted by author of the article according to (Nacionalinė žemės..., 2008 – 2019)

In Palanga, it is necessary to protect water bodies from pollution and the entry of hazardous substances, to protect shores of water bodies from erosion, to protect the natural landscape of the coast and to facilitate recreational activities.

Wetlands. In the municipality of Palanga in 2008-2019 wetland area increased from 21.44 ha in 2008 to 32.00 ha in 2019. The area increased by 10.56 ha during the analyzed period or in 2019 made up 0.40 of the total municipal area (Fig. 4).

The largest and most important wetland in Palanga is the Būtingė Bird Marsh Ornithological Reserve, which hosts breeding terrestrial and water birds.

Thus, unlike Klaipėda County and the Republic of Lithuania, the area of wetlands in Palanga City Municipality increased. In the county, wetland area decreased by 591.09 ha or 8.38 percent and in 2019 accounted for 1.24 percent of the county's area. In Lithuania, wetlands made up 23761.19 ha or 20.09 percent of the area of the county, in 2019 accounted for 1.44 percent of the area of the country.

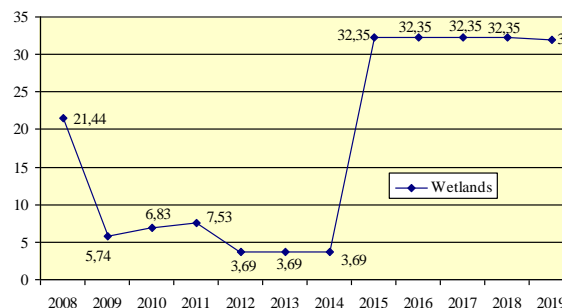


Figure 4. Wetlands change in Palanga City in 2008-2019 (consisted by author of the article according to (Nacionalinė žemės..., 2008 – 2019)

The analysis of the changes in the areas of natural landscape components of the Palanga municipality showed that the areas of water bodies (89.46 ha or 61.44 percent) and wetlands (10.56 ha or 49.25 percent) increased, but the forest area decreased. (53.68 ha or 1.70 percent).

Changes in the Natural Landscape during the period of the years 2008 and 2019

Examining the components of the natural landscape of the resort municipality analyzed, it can be seen that this landscape in 2008 occupied 3325.54 ha (Fig.5).

In 2008 – 2019, natural landscape increased by 46.34 ha or 1.39 percent. The increase of the natural landscape area was determined by the development of water bodies and wetland areas.

In 2019, the natural landscape in Palanga municipality occupied 3371.88 ha and accounted for 42.58% of the municipal area.

In Klaipėda County during the period of the years 2008 and 2019, the natural landscape area increased by 888.31 ha or 0.45 percent, while in Lithuania the natural landscape also increased by 0.73 percent.

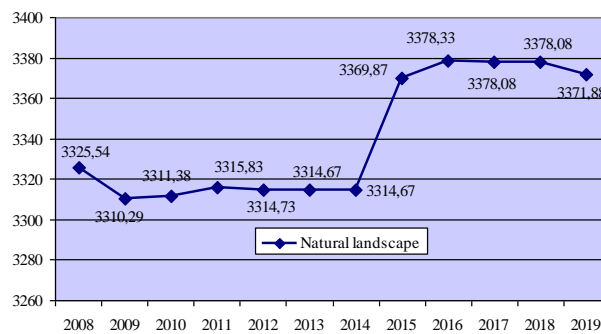


Figure 5. Natural landscape change in Palanga City in hectares during the period between the years 2008 and 2019 (consisted by author of the article according to (Nacionalinė žemės..., 2008 – 2019)

The morphological diversity of Palanga landscape and abundance of natural values provide conditions for sustainable urban development, but dictate clear requirements for use and protection (Savivaldybės įmonė..., 2008).

Effective management of the condition of the landscape is only possible if the processes in the landscape are well understood. Landscape intersects with natural processes and human activities, which are not completely controlled but only partially regulated by political and economic decisions, although to a greater extent human rights are at stake. Therefore, recommendations for condition management can and should be formulated without strictly preventing spontaneous processes in both nature and society, but only by modifying them in the right direction (Lietuvos geografų..., 2015).

CONCLUSIONS

1. Palanga City is located in the northwest of Lithuania, in the territory of Klaipėda County. Palanga is a climatic and balneological resort by the Baltic Sea. The northern part of Palanga belongs to the Seaside Regional Park, in which the Plazė Nature Reserve, the Nemirseta Landscape Reserve, part of the Šaipiai Landscape Reserve and a small part of the Karklė Marine Reserve are located.
2. The analysis of the changes in the areas of natural landscape components of the Palanga city municipality showed that the areas of water bodies (89.46 ha or 61.44 percent) and wetlands (10.56 ha or 49.25 percent) increased, but the forest area decreased (53.68 ha or 1.70 percent).
3. During the period of 2008 – 2019, natural landscape increased by 46.34 ha or 1.39 percent. The increase of the natural landscape area was determined by the development of water bodies and wetland areas.

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