THE CHANGE OF ANTHROPOGENIC LANDSCAPE IN LITHUANIAN RESORTS

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Abstract
Resorts in the Republic of Lithuania are residential areas with natural healing factors (mineral water, healing mud, health-friendly climates, recreational areas and water bodies) and a special infrastructure enabling them to use these factors. Currently, there are 4 resorts in the country: Birštonas, Druskininkai, Neringa and Palanga.
The purpose of this article is to carry out an analysis of the anthropogenic landscape of the resorts of the Republic of Lithuania in 2007-2018. During the preparation of the article, the following scientific methods were used: literature analysis, determination and evaluation of the current situation, grouping method, comparison method, analytical and statistical analysis methods, logical analysis, graphical method.
The analysis showed that the anthropogenic landscape of the three resorts increased: in Druskininkai – by 362.65 ha or 18.17%, in Neringa – by 113.43 ha or 52.78%, in Palanga – by 190.74 or 15.09%. The anthropogenic landscape of Birštonas has decreased by 41.11 ha or 5.03%.
Over the past decades, with the intensification of anthropogenesis and its accompanying urbanization, the importance of the natural environment has become more and more understood, and landscape research, which is associated with the assessment of naturalness and its problems, is becoming more and more relevant.
Key words: resort, landscape, anthropogenic landscape.

Introduction

According to the European Convention (European, 2000), the landscape is an important component of the quality of life for people everywhere, which expresses cultural heritage and natural diversity. The convention states that the landscape is a human perceived area, whose character is the result of the action and interaction of natural and/or human factors.

Countries ratifying the European Landscape Convention (ELC) agree to identify their landscapes, analyse their characteristics and assess the landscapes taking into account the values designated to them by the population (Herlin, 2016).

In the resolution 'On Approving the Description of the Landscape Policies of the Republic of Lithuania' approved by the Government of the Republic of Lithuania, the landscape is defined as the territorial component of the natural and/or anthropogenic components of the earth's surface, which is related to the material, energy and communication links. This is a territory, whose nature was determined by natural and/or anthropogenic factors and their interaction (Lietuvos, 2004).

Landscape is a complicated polyfunctional, constantly evolving system, altered or otherwise influenced by human beings (Skorupskas, 2004).

According to D. Veteikis, M. Jankauskaitė (2004), the landscape is mainly analyzed as a result of the interaction between nature and man. The quality of the landscape is influenced by the natural, economic and other activities of a person.

Landscape is a constantly changing and evolving system; therefore, the emergence of new landscape components, qualitative and quantitative changes is constantly taking place. The interaction of nature and human activity is changing landscape.

Anthropogenic landscape is a highly altered landscape of human activity (Ellis *et al*., 2006). People constantly change their surroundings. The environment can be changed directly and indirectly (Binford, Lee, & Townsendt, 2004).

Article relevance. Human activity is more or less noticeable throughout the landscape. Paving of roads, construction of buildings and extraction of mineral deposits, development of landfills have an impact on the landscape, but this is often a disadvantage for the environment (Bastian & Bernhardt, 1993). The environment, with anthropogenic factors, is filled with artificial, often disharmonious, technogenic derivatives that destroy the internal relations of natural landscape systems. Thus, in order to balance the internal structure of natural and anthropogenic areas, to determine the guidelines for the protection of the landscape, the assessment of the degree of artificiality/naturalness of the components of the earth's surface are of particular relevance (Jukna & Veteikis, 2011).

E. Piškinaitė and D. Veteikis (2014) also emphasize the importance of landscape research, noting that over the past decades, with the intensification of anthropogenization and its accompanying urbanization, the importance of the natural environment has become increasingly understood, and therefore landscape research related to the assessment of naturalness and the problems created are becoming more and more alert (Piškinaitė & Veteikis, 2014).

The object of this article is the anthropogenic landscape of the resorts of the Republic of Lithuania.

The aim is to carry out an analysis of the changes in the anthropogenic landscape of the resorts of the Republic of Lithuania during the period between the years 2007 and 2018.

Tasks to be solved:

1. To describe the current state of the landscape of the resorts.

2. To analyze the components of anthropogenic landscape of Birštonas, Druskininkai, Neringa municipalities, Palanga city, and their changes.

3. To study the change of anthropogenic landscape area in Lithuanian resorts during the period between the years 2007 and 2018.

Materials and 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 land fund statistics of the Republic of Lithuania (Nacionalinė žemės, 2007-2018), graphically depicted in figures, were used for the fulfilment of the research of the Lithuanian resorts anthropogenic landscape change for the years 2007-2018.

During the analysis the Lithuanian resorts statistics were compared with the Republic of Lithuania.

Results and Discussion

Analysis of the current situation. Resorts, which have natural healing factors (mineral water, healing mud, health-friendly climate, recreational areas and water bodies), and special infrastructure, which make it possible to use these factors for treatment, prophylaxis and rest, are considered as resorts in Lithuania. Currently there are 4 resorts: Birštonas, Druskininkai, Neringa and Palanga. There are also 9 resort areas (similar requirements apply to resorts, but there may not be special infrastructures for treatment).

Birštonas is a beautiful sanatorium treatment, wellness, tourism and entertainment center, a curative and resorting natural and cultural heritage resort of sustainable territorial development (Birštono, 2007).

In 1992, Nemunas Loops Regional Park was established – one of the largest regional parks in the country, covering over 25 thousand ha of land, which aims to preserve the unique landscape formed by the river Nemunas. 82% of the territory of Birštonas municipality is located in the Nemunas Loops Regional Park. There are 18 operating water wells and many inactive ones in the resort.

The total area of the municipality is 12171.76 ha. In 2018, the largest part of it was covered by forests – 47.87% (5827.24 ha) and agricultural land (4376.88 ha or 35.96%). The roads accounted for the smallest part – 1.92% (233.10 ha).

In 2018, water bodies occupied 737.98 ha (6.06%). Area of wetlands during 2007-2018 decreased by 36.43 ha or 57.17% and in 2018 occupied an area of 27.29 ha.

Druskininkai is an international year-round mineral water, mud and climate therapy resort, which is a city in southern Lithuania, 120 km from the capital Vilnius.

It is a richly nature-rewarded resort that has been valued for centuries for its natural and healing resources. It is the largest resort located in the south of the country, which combines the peace of the forests and modern resort therapies (Druskininkų, 2016).

In the resort, there is a picturesque landscape of the Raigardas Valley, which is currently recognized as a landscape reserve and which is distinguished by pure water springs and flat fields. The spectacular street village of Švendubrė, located 5 km from Druskininkai, is famous not only for its old streets, but also for a wonderful hill called the Black Mountain, old country homesteads of ethnographic Dzūkija region and the famous 'Devil Stone' in Švendubrė village, a geological monument.

Druskininkai municipality area covers 45301.20 hectares. The largest share of the municipality in 2018 took forests (31430.21 ha or 69.38%), the smallest – roads (759.71 ha or 1.68%).

Area of water bodies during the period between the years 2007 and 2018 increased by 279.04 ha or 25.46%. During the mentioned period, the area of wetlands decreased by 260.04 ha or by 40.26%.

Neringa is a resort located in the Curonian Spit, between the Baltic Sea and the Curonian Lagoon (western coast). It is the longest (about 50 km) and the most distant city in Lithuania (Neringa, 2018).

The municipality of Neringa occupies 13883.65 ha and makes up 2.66% of the territory of Klaipėda County. In 2018, the largest area of the municipality was occupied by forests – 7132.72 ha (51.37%), the smallest – by agricultural land – 20.27 ha (0.15%). In the municipality, the waters made up 35.27 percent and occupied 4897.16 ha. The area of wetlands during the period between the years 2007 and 2018 decreased by 20.90 ha (84.96%) and by 2018 occupied 3.70 ha.

Neringa has 6 parks and 4 squares occupying about 17.05 ha.

The landscape of the Curonian Spit is the cultural landscape formed in the sand dune during the 19th century based on human ecological wisdom, great physical effort and financial expenses (Bučas, 2007).

A special feature of this municipality is that its entire territory as far back as the 1960s was declared as the Landscape Reserve, in 1966, – as Landscape Reserve with a special regime, and in 1991, it was assigned to the established Curonian Spit National Park. In addition, on November 29, 2000, the Curonian Spit as a unique site with an exceptional cultural landscape, decided by the UNESCO World Heritage

Committee, was listed on the World Heritage List as a group of cultural landscapes (Urbanistika, 2012).

Palanga resort 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 (Palangos, 2017).

The city municipality occupies an area of 7918.80 ha and makes up 1.52% of the Klaipėda County territory. In 2018, the largest part of the municipality consisted of forests (39.36%), the smallest – of roads (2.80%). In the municipality, water bodies occupied 228.80 ha and amounted to 2.89% of the analyzed territory's area. In 2018, wetlands occupied 32.35 ha. Since 2007 their area increased by 10.91 ha (50.89%).

Palanga resort on the Baltic seaside extends about 24 km. The modern Palanga resort is the result of the formation of a seaside settlement, port, town, city in the historical space (Jankauskaitė, 2016).

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.

Anthropogenic component change. Landscape changes such as new roads and buildings, changes in the agricultural and forestry network, the loss of elements of the traditional agricultural landscape, new solitary trees, and new roadside slopes have been associated with political driving forces (Hersperger & Burgi, 2010).

Anthropogenic areas include: built-up areas, roads, damaged land. In 2007-2018, the area of roads in *Birštonas resort* decreased by 29.22 ha or 11.14% and in 2018 occupied 233.10 ha (Figure 1).

The reason for the decline in road area was the fact that by 2015 data from theoretical calculations were inaccurate and cadastral measurements started in 2015, where data on road occupied areas are annually adjusted. At present in Lithuania, 50% of the cadastral measurements of road areas are carried out, including the Kaunas County, where Birštonas is located. Thus, the decrease of road areas is conditional.

In the Republic of Lithuania in 2007-2018, for the above reasons, the area of roads decreased by 26692.50 ha (20.20%).

In 2018, the built up area occupied 530.73 ha. During the analyzed period, the area decreased by 7.11 ha or 1.32%. A decrease was relative, since in 2015 the geographical information system and data bank were supplemented with new data and spatial data on land plots, buildings, addresses, engineering networks, forests, etc. were updated.

In 2007-2018, the area of damaged territories in Birštonas decreased by 4.78 ha (29.15%) and by 2018 occupied 11.62 ha. Illegal landfills, garbage dumps, and special waste disposal sites were eliminated in Birštonas within the framework of European Union directives and regulations.

The analysis of anthropogenic components in the municipality of Birštonas showed that the area of roads and built-up areas decreased relatively due to the measurements and data correction, damaged land decreased due to the European Union waste management policy.

In 2007, the anthropogenic landscape made up 6.71% of the total area of Birštonas and occupied 816.56 ha (Figure 2).

During the analyzed period, the anthropogenic landscape of Birštonas decreased by 41.11 ha or 5.03%.

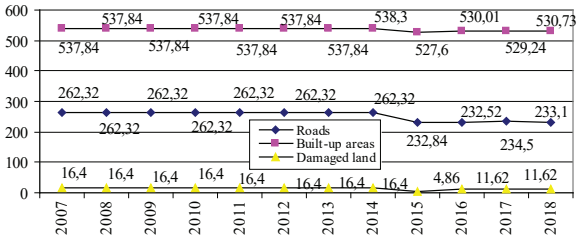

Figure 1. Changes in anthropogenic landscape components of the Birštonas municipality in hectares during the period between the years 2007 and 2018 (Nacionalinė, 2007-2018), (Created by the author of the article).

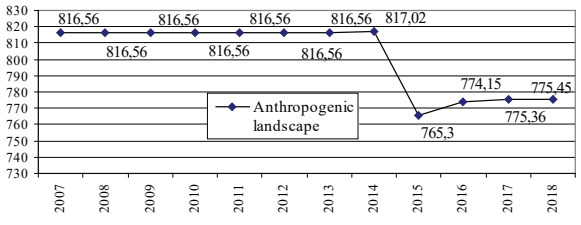

Figure 2. Anthropogenic landscape change in Birštonas in hectares during the years 2007 and 2018 (Nacionalinė, 2007-2018), (Created by the author of the article).

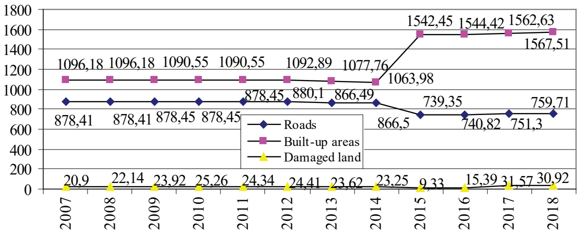

Figure 3. Changes in anthropogenic landscape components of the Druskininkai municipality in hectares during the period between the years 2007 and 2018 (Nacionalinė, 2007-2018), (Created by the author of the article).

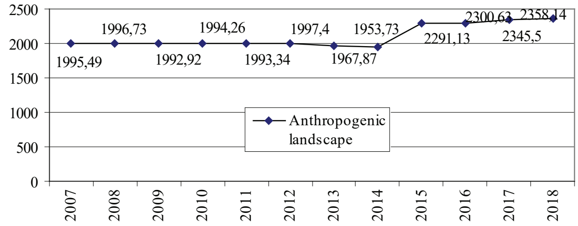

Figure 4. Anthropogenic landscape change in Druskininkai in hectares during the years 2007 and 2018 (Nacionalinė, 2007-2018), (Created by the author of the article).

The largest part of the landscape was made up of built-up territories (68.44%), the smallest part – by damaged land (1.50%).

In Druskininkai in 2018, roads accounted for 1.68% (759.71 ha). During the period between the years 2007 and 2018, the road area in the municipality has decreased by 118.70 ha or 13.51% (Figure 3). The reason for the decrease is the same as in Birštonas, i.e. cadastral measurements and refinement of data.

The area of the built-up territories in the resort during the analyzed period increased by 471.33 ha or 43.00% and in 2018 accounted for 3.46% of the Druskininkai resort area. The area has been growing due to the ongoing urban development.

The area of built-up territories in Lithuania during the decade increased by 57753.46 ha (32.07%). It follows that the development of these territories in Druskininkai is higher than the national average.

The area of damaged land has also increased. During the period between the years 2007 and 2018, the area increased by 10.02 ha (47.94%), when the area of damaged land during the analyzed period in Lithuania increased by 744.21 ha or 3.17%.

Damaged land in 2018 amounted to 0.05% of the municipality's territory. The development of municipal waste management infrastructure and the improvement of the development or creation of separate municipal waste collection capacities, influenced the development of the damaged area.

The analysis of the changes in the anthropogenic landscape components shows that the area of built-up territories and damaged area increased (43.00% and 47.94% respectively) and the area of roads has decreased by 13.51%.

In Druskininkai during the period between the years 2007 and 2018, the anthropogenic landscape increased by 362.65 ha (18.17%). In 2007, this landscape made up 4.40% of Druskininkai area, in 2018 – 5.21% (Figure 4).

The largest part of the anthropogenic landscape was occupied by the built-up territories (66.47%), the smallest – by damaged territories (1.31%).

In Neringa, the road area decreased by 0.30 ha (0.20%) during the period between the years 2007 and 2018 and in 2018 occupied 152.71 ha and amounted to 1.10% of the municipality's territory (Figure 5).

The built-up territories in Neringa municipality in 2018 occupied 173.65 ha comprising 1.25% of the municipality's area. In 2007-2018, the area of the built-up territory increased by 111.74 ha or 180.49%, with the country's average of 31.29%.

In Neringa municipality, the regulation of spatial planning, preservation of the natural landscape and illegal, arbitrary construction is particularly interspersed. In the course of various constructions, it is threatened to lose valuable and unique identity in the area.

In 2007-2010, there were no damaged lands in the municipality. In 2011, their area has already occupied

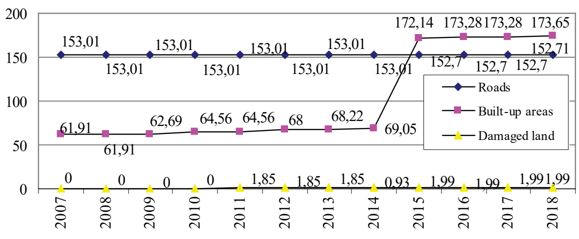

Figure 5. Changes in anthropogenic landscape components of the Neringa municipality in hectares during the period between the years 2007 and 2018 (Nacionalinė, 2007-2018), (Created by the author of the article).

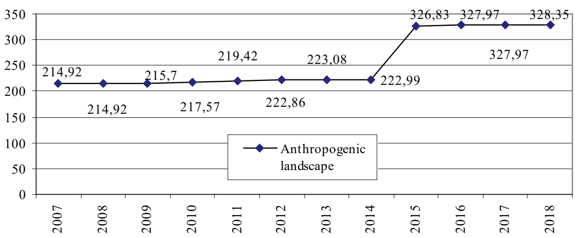

Figure 6. Anthropogenic landscape change in Neringa in hectares during the years 2007 and 2018 (Nacionalinė, 2007-2018), (Created by the author of the article).

1.85 ha. In 2018, the area under consideration increased and occupied 1.99 ha and amounted to 0.01% of the municipality's area. During the period between the years 2007 and 2018, the area increased by 1.99 ha.

After analyzing the components of the anthropogenic landscape of the municipality of Neringa, it has been established that the area of built-up territories (111.74 ha or 180.49%) and the damaged land (1.99 ha) increased and the road area (0.30 ha or 0.20%) decreased slightly. The area of roads decreased relatively, as several cadastral measurements were carried out, during which the area was refined.

In 2018, anthropogenic landscape of Neringa municipality made up 2.36% or 328.35 ha (Figure 6). During the period between the years 2007 and 2018, the area of the analyzed landscape increased by 113.43 ha or 52.78%.

The largest part of the anthropogenic landscape consists of built-up territories (52.88%) and roads (46.51%). Damaged land constitutes the smallest part of the anthropogenic landscape – 0.61%.

In 2018, the roads of the *Palanga city* municipality occupied 221.91 ha and amounted to 2.80% of the municipality's territory area (Figure 7).

For twelve years, the road area has increased by 13.36 ha or 6.41%. During the analyzed year, the development of road infrastructure was carried out, parking lots, etc. were erected in the municipality.

In the municipality, built-up territories in 2007-2018 increased by 208.28 ha or 20.42%. The area has been growing due to the intensification of constructions in the municipality. In Palanga, as in the municipality of Neringa, there are problems with illegal construction, as well as problems with violations related to construction projects.

In 2018, the built-up territories occupied the area of 1228.40 ha and amounted to 15.51% of the municipality territory.

Damaged land in the municipality in 2007 occupied 35.42 ha. Due to implemented European waste management directives and legal acts of the Republic of Lithuania, the area of damaged lands in the municipality has decreased by 30.90 ha or 87.24%. In 2018, the damaged area occupied 4.52 ha and amounted to 0.06% of the municipality area.

It was established that during the years 2007-2018 the areas of anthropogenic landscape components of Palanga city municipality were as follows: areas of roads (13.36 ha or 6.41%) and built-up territories (208.28 ha or 20.42%) increased, damaged land areas (30.90 ha or 87.24%) – decreased.

In 2007, the anthropogenic landscape of Palanga city municipality occupied 1264.09 ha and amounted to 15.96% of the municipality's area, in 2018 it occupied 1454.83 ha (18.37%) (Figure 8). During the period between the years 2007 and 2018 the area of anthropogenic landscapes increased by 190.74 ha or 15.09%. The area has been growing due to the development of built-up territories and road areas.

The built-up territories formed the largest part of the anthropogenic landscape of Palanga city municipality (84.44%). The damaged lands formed the smallest part (0.31%). Roads made up 15.25% of the anthropogenic area of the municipality.

After analyzing the changes in the anthropogenic landscape of the four resorts of the Republic of Lithuania, it is evident that the landscape area analyzed in the three resorts (Druskininkai, Neringa, Palanga) has increased. The biggest development in hectares was in the Druskininkai resort (362.65 ha). In these resorts were the most expanded areas of the built-up territories.

In the only Birštonas resort the area of anthropogenic landscape decreased (41.11 ha). From the analysis above, it is clear that this decrease is relative (due to the correction of the measurement data of areas).

Anthropogenic landscape in the Republic of Lithuania in 2007 accounted for 5.14%. During 2007-2018 its area increased by 9.47% and in 2018 amounted to 5.63% of the country's area. Thus, the development of anthropogenic landscapes in the resorts was more rapid in comparison with the increase in the total area of anthropogenic landscape

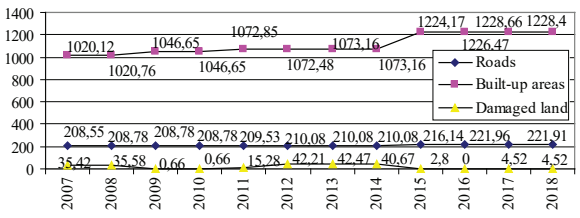

Figure 7. Changes in anthropogenic landscape components of the Palanga municipality in hectares during the period between the years 2007 and 2018 (Nacionalinė, 2007-2018), (Created by the author of the article).

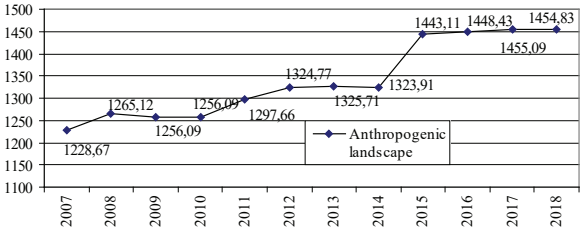

Figure 8. Anthropogenic landscape change in Palanga in hectares during the years 2007 and 2017 (Nacionalinė, 2007-2017), (Created by the author of the article).

in Lithuania: in Druskininkai – 362.65 ha or 13.17%, in Neringa – 113.43 ha or 52.78%), in Palanga – 190.74 ha or 15.09%.

It is argued that the protection of landscape diversity is as important as the protection of bio-diversity, in the world where an accelerating rate of technological change is forcing cultural landscapes to change in the direction of greater uniformity (Ermischer, 2007).

Urbanization processes show cycles of evolution that spread in different ways through space. Urbanized landscapes are highly dynamic, complex and multifunctional. Therefore, detailed inventories of landscape conditions and monitoring of change are urgently needed in order to obtain reliable data for sound decision-making (Antrop, 2004).

Landscape change is related to the development of anthropogenic components, the relationship between urbanized and natural areas. Knowing that anthropogenic processes reduce the natural resources, it is necessary to preserve the valuable landscapes of the Republic of Lithuania, including their resorts, their identity and to reduce the causes of negative change caused by anthropogenization; it is necessary to eliminate the factors that influence the negative landscape changes.

Conclusions

1. There are 4 resorts in Lithuania: Birštonas, Druskininkai, Neringa and Palanga. Birštonas is one of the oldest balneological resorts in Lithuania. Druskininkai is a mineral water, mud and climate therapy resort. Neringa is a resort located on the Curonian Spit, between the Baltic Sea and the Curonian Lagoon, famous for its unique landscape. Palanga is one of the largest Lithuanian resorts and tourist centers.
2. In Birštonas municipality, the area of roads (29.22 ha or 11.14%) and built-up territories (7.11 ha or 1.32%) declined relatively, due to measurements and data correction, damaged land (4.78 ha or 29.15%) – decreased because of the ongoing European Union waste management policy.
3. In Druskininkai, during the period between the years 2007 and 2018 the road area in the municipality has decreased by 118.70 ha or 13.51%. The area of built-up territories in the resort increased by 471.33 ha or 43.00%, while the damaged area increased by 10.02 ha or 47.94%.
4. In Neringa, the area of roads has decreased by 0.30 ha (0.20%). The area of the built-up territories has increased by 111.74 ha or 180.49%. The area of damaged land in 2007-2017 increased and occupied 1.99 ha.
5. In Palanga, the road area increased by 13.36 ha or 6.41%, the built-up area was 208.28 ha or 20.42%. The area of damaged land in the resort has decreased by 30.90 ha (87.24%).
6. During the period between the years 2007 and 2018 the area of the anthropogenic landscape in Druskininkai increased by 362.65 ha (18.17%), in Neringa – by 113.43 ha (52.78%), in Palanga – by 190.74 ha (15.09%). The area has been growing due to the development of built-up territories. The anthropogenic landscape of Birštonas has decreased relatively by 41.11 ha or 5.03%.
7. It was determined that the landscape area analyzed in the three resorts (Druskininkai, Neringa, Palanga) has increased. The biggest development in hectares was in the Druskininkai resort (362.65 ha). The most expanded areas of the built-up territories were in these resorts.

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