

THE CHANGE OF LANDSCAPE IN LITHUANIA DURING THE PERIOD OF 2002-2020

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The object of the investigation – landscape in Lithuania Republic.

The aim of the investigation is to carry out the analysis of the changes in Lithuania landscape (natural, anthropogenized, anthropogenic) during the period between 2002 and 2020.

Tasks of the investigation:

1. To analyze the change of Lithuania's natural landscape in 2002-2020.
2. To investigate the change of anthropogenized landscape and components.
3. To study the change of anthropogenic landscape in Lithuania.

Materials and Methods

Comparative, analytical as well as statistical and logical analysis methods were used for the research. The land fund statistics of the Republic of Lithuania, graphically depicted in figures, were used for the fulfilment of the research of the landscape (natural, anthropogenized, anthropogenic) change in Lithuania for the years 2002 - 2020.

Lithuanian natural landscape

The structure of the Lithuanian landscape, formed and shaped by natural and anthropogenic factors, is diverse and multi-layered.

Forests, water bodies and wetlands are components that make up the natural landscape.

The tendencies of changing the naturalness of the landscape are to some extent expressed by the development of the country's forest cover. In Lithuania forest area covers 2,156,033.39 hectares or 33.02 %. Comparing 2002 with 2020, the forest area in Lithuania increased by 159,154.22 hectares, i.e. 7.97 percent.

The forest area has developed due to participation in the Rural Development Program, the enforcement of the forest development program and etc.

Another component of the natural landscape is water bodies. In 2020, water bodies in the country occupied 266,532.84 hectares and accounted for 4.08 percent of the territory of Lithuania. After the analysis of the change of water bodies in 2002 - 2020, it was established that their area increased by 4,368.39 hectares or 1.67 percent.

Wetlands in Lithuania in 2002 occupied 147,078.84 hectares, in 2020 – 94,871.10 ha, which means that in 2002 - 2020 the area of wetlands decreased by as much as 52,207.74 ha or 35.50 percent.

The wetland area was shrinking due to human activities, climate change and natural processes.

The analysis of the components of the relatively natural landscape shows that the area of forests and water bodies increased between 2002 and 2020, but unfortunately the area of wetlands decreased.

Examining the change of the natural landscape, it was found that the area increased by 111,314.87 ha or 4.63 percent during the analyzed period (Fig. 1).



Figure 1. Natural landscape area change in hectares in Lithuania 2002-2020

The natural landscape area has increased due to the development of forests and water bodies.

Anthropogenized landscape

The following components can be included in the anthropogenized landscape: agricultural land (arable land, orchards as well as meadows and natural pastures), tree and shrub plantations, unused land.

The area of agricultural land in Lithuania decreased by 88,053.11 ha or 2.53 percent in 2002-2020. Human economic activity influences the change of land use, as the composition of land use changes with the change of purpose.

Greenery of trees and shrubs in the analyzed period increased as much as 117,643.34 ha or 138.91 percent. The reason for the increase of this land use is the development of green areas and the implementation of afforestation programs.

In 2002-2020, the areas of unused land in Lithuania decreased by 166,692.67 ha or 80.36 percent.

The analysis of the change in the areas of the components of the anthropogenized landscape shows that in the Republic of Lithuania in 2002-2020 the areas of agricultural land and unused land decreased, and the areas occupied by trees and shrubs increased.

Between 2002 and 2020, the area of the anthropogenized landscape decreased by 137,102.44 ha or 36.34 percent. (Fig.2).

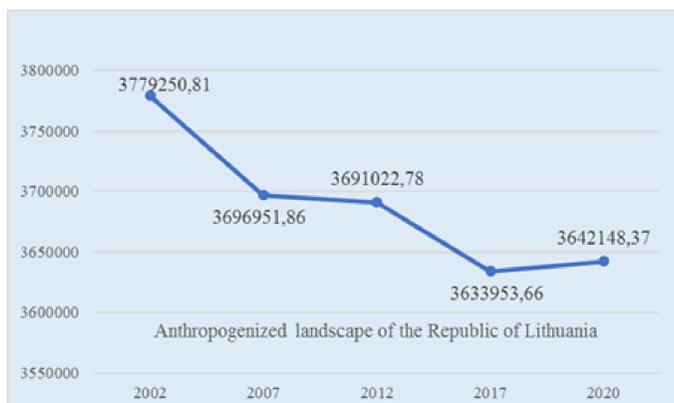


Figure 2. Anthropogenized landscape change in Lithuania in hectares during the period between the years 2002 and 2020

The reason for the decrease in the area of anthropogenized landscape is the decrease in the area of agricultural land (2.53 %) and unused land (80.36 %).

Anthropogenic landscape

Anthropogenic landscape include: built-up areas, roads and damaged land.

In the period of 2002-2020, the area of built-up territories in Lithuania increased by 51,373.81 ha or 27.32 percent and in 2020 it occupied 239,421.21 ha.

Based on the data of the Land Fund of the Republic of Lithuania (Nacionalinė, 2002-2020), it was established that in 2002-2020 the road area in the country decreased by 26,199.14 ha or 19.91 percent. In 2020, the road area covered 105,401.82 hectares.

It can be said that this decrease in road area is conditional, because until 2007 the data of theoretical calculations of road area were provided, which were inaccurate, and in the following years cadastral measurements were started, during which data on road area are constantly updated every year. At present, more than 50 percent of cadastral measurements of road areas have been performed in Lithuania.

In 2002-2020, the area of damaged land in the Republic of Lithuania decreased by 762.12 ha or 3.05 percent.

The area of damaged land decreased due to the closure of non-compliant landfills and the disposal of illegal landfills, as well as the reclamation of quarries.

After analyzing the change in the area of the Lithuanian anthropogenic landscape in 2002-2020, it was established that the above area increased by 24,412.55 ha or 7.08 percent. (Fig. 3).

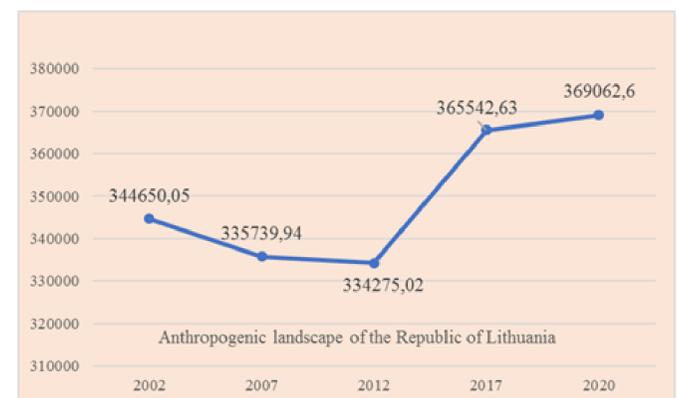


Figure 3. Anthropogenic landscape change in Lithuania in hectares during the period between the years 2002 and 2020

The reason for the increase in the area of anthropogenic landscape is the development of built-up areas (27.32%).

After the analysis of the landscape of the Republic of Lithuania, it was established that in 2020 the anthropogenized landscape occupied the largest part of the country's landscape (55.79 % or 3,642,148.37 ha), the smallest part of the landscape was occupied by anthropogenic one (5.65% or 369,062.60 ha). The natural landscape in Lithuania occupied 2,517,437.33 ha and accounted for 38.56 percent of the country's territory (Fig. 4).

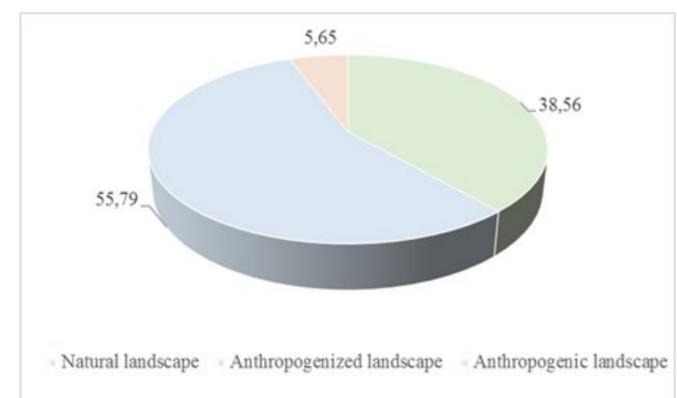


Figure 4. Distribution of Lithuania landscape in 2020, in percent

The optimal landscape structure of a country is assessed on the basis of geoeological compensation index, when the active part of anthropogenic (anthropogenized) land occupies 38 percent, passive part or natural (relatively natural) land occupies 62 percent. Thus, the landscape cannot be considered optimal if the minimum percentage of natural areas required to compensate for anthropogenic impacts is not reached.

Conclusions

1. After the analysis of landscape change in the Republic of Lithuania during the period between the years 2002 and 2020, it was established that the area of natural landscape increased by 111,314.87 ha or 4.63 percent, the area of anthropogenic landscape increased by 24,412.55 ha or 7.08 percent, the area of anthropogenized landscape decreased by 137,102.44 ha or 36.34 percent.
2. In 2020, the largest part of the country's landscape made up anthropogenized landscape (55.79 percent or 3,642,148.37 ha), the smallest - anthropogenic (5.65 percent or 369,062.60 ha). The natural landscape covered 2,517,437.33 ha and accounted for 38.56 percent of the country's territory.