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TREES AND SHRUBS GREENERY AREA CHANGES IN KLAIPEDA COUNTY (2002-2022)

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Abstract
Greenspaces are an important component of the complex ecosystem. Trees and green spaces are also very important to human well-being as well. It is widely known that trees and green spaces give environmental, social, economic and psychological benefits. For example they affect microclimates to reduce the heat effect, improve air quality. Understanding the relationship between population size and the quality and quantity of green spaces is vital for the sustainability, health and resilience of areas.
Analysis of the current situation of the trees and shrubs greenery area in Klaipeda county was accomplished. The study also provides the trees and shrubs greenery area changes analysis in Klaipeda county and in the municipalities of the county.
In Klaipeda county the area under trees and shrubs in 2002 was 4,758.14 ha. In 2022 the plantation area amounted to 10,793.50 hectares. From 2002 to 2022 the area of tree and shrub plantations in Klaipeda county increased by 6,035.36 ha or 127 percent. The development of plantation areas has been positively influenced by the creation of an appropriate legislative framework and the implementation of plantation programmes in municipalities.
Key words: trees and shrubs, greenery, area change.

Introduction

Article relevance. Environment sustainability progressively requires the abatement of pollution, plus the addition of positive features, especially trees, to improve the new deficiency of healthy environments. An environment with high-quality and plentiful green spaces epitomizes good planning and management, a healthy environment for humans, vegetation and wildlife populations.
Trees and green spaces are very important to human well-being. It is established that trees and green spaces give environmental, social, economic and psychological benefits. They affect microclimates to reduce the heat effect, improve air quality. Trees and green spaces improve public health outcomes, increase social relationship, support biodiversity, and can increase property values, as well (Nesbitt, Metner, 2016).
Contact with nature such as public parks, wellbeing and human health. Access to green space is associated with a greater possibility of being physically active. Species richness present in a green area and perceived by people is positively linked to an excellent connection with nature and a better site fulfillment. If the environment is aesthetically attractive and space allows chance for gardening and for recreation, people are inspired to visit it, ameliorate social relationship within the neighborhood, which in turn can generate adventageous effects on wellbeing. Trees provide few ecosystem services that help to boost human wellbeing and can soften the negative impacts (Battisti, Pille, Larcher, Saumel, 2019).
Greenspaces are an important component of the complex ecosystem. Forests, parks and farmlands are types of greenspace, which have important ecological, social and economic functions. It benefits communities environmentally, recreationally, esthetically, and economically (Li, Wang, Paulussen, Liu, 2005).
Green spaces mean green spaces in parks and other natural areas. They are of strategic importance for carry on a high quality of life in increasingly community. The significance contributions of green spaces to the quality of urban life include (Tian, Y., Tao, Y. (2012):

1. The generally known environmental advantage of green spaces to the air, water, soil, and the ecosystem as a whole;
2. The psychological and physical advantage of reduced stress to people through the stimulation of physical activity, privacy, and intimacy as well as the preservation of aesthetic and historical continuity;
3. The social and economic advantage of increasing social integration and interaction among neighbors and generating revenue and employment.

The authors Mei-Yee Teoh, Michihiko Shinozaki, Kei Saito and Ismail Said (2021) also describe the benefits of green spaces, by stating that: in summer trees and shrubs greenery affects microclimate

through temperature, wind and humidity modification. Trees canopies give shading, blocking an essential amount of short-wave radiation by reflection and transmission through their leaves. Also, the tree canopies could detain the long-wave radiation reflectivity from the ground to the atmosphere. The evapotranspiration of leaves helps reduce the surrounding temperature by converting sensible heat into latent heat and increased relative humidity.

Although the cooling effect of greenery has been noticed by various authors, studies that quantify the possible effects of different greenery scenarios (including various vegetation coverage and greenery types) on the thermal environment are deficient (Yang, Liu, Sun, Zhu, Wang, Xiong, Jiang, 2015).

The international minimum standard of urban greenery proposed by the World Health Organisation (World Health Organization, 2012) is 9 m^2 of green space per resident, yet the developed countries have raised their standard to 20 m^2 green space per capita, because of increasingly consciousness and require for greenery areas by community.

Nowadays, functional management of greenery has become necessity in planning, as it is linked to the general health and wellbeing of residents (Darkwah, Cobbinah, 2014).

Methodology of research and materials

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

The article analyses work of foreign scientists, published in scientific publications.

The land fund statistics of the Republic of Lithuania (Nacionalinė žemes..., 2002-2022), graphically depicted in figures, were used for the fulfillment of the research of the trees and shrubs greenery area change in Klaipeda county for the years 2002 - 2022.

The article analyzed and assessed the current state of the trees and shrubs greenery in Klaipeda county. The study provides the trees and shrubs greenery area change analysis in Klaipeda county and in the municipalities of the county. The 20 years period, i.e. the period between the years 2002 and 2022, was selected for the determination of the change. Statistics data were systematized, and analyzed and the expression of the percentage was calculated during the preparation of the research.

The object of the investigation is Klaipeda county's trees and shrubs greenery area.

The aim of the investigation is to carry out the analysis of the Klaipeda county trees and shrubs greenery area during the period between the years 2002 and 2022.

Tasks of the investigation:

1. To analyze the current situation of trees and shrubs greenery in Klaipeda county.
2. To investigate tree and shrubs greenery area change in Klaipeda county during the period between the years 2002 and 2022.
3. To examine the change of trees and shrubs greenery in the municipalities of the county.

Discussion and results

The status quo trees and shrubs greenery in Klaipeda county.

Plots of land set aside for individual green areas are created and managed for recreational, scientific, educational, cultural, cognitive, recreational, aesthetic and other public needs. In order to create new individual public green areas or transform existing individual public green areas, it is necessary to prepare a landscaping project (Lietuvos Respublikos želdynų įstatymas, 2007).

In 2022, tree and shrub plantations in Klaipeda county covered 10,793.50 ha, accounting for 2.07 percent of the county's area.

Today's landscape is not homogeneous. It is cultivated differently in different parts of the territory, with different economic and social functions, cultural and social significance, form, structure, and expression. There are seven municipalities in Klaipeda county where green spaces are unevenly distributed.

An analysis of the area of tree and shrub plantations in Klaipeda municipalities shows that the largest number of trees and shrubs is found in Silute (4,452.53 hectares) and Klaipeda (2,784.31 hectares) districts, while the smallest number of trees and shrubs is found in the municipality of Neringa (20.68 hectares or 0.15 percent) (Table 1).

Table 1

Trees and shrubs greenery area in hectares and percent in municipalities of Klaipeda county in 2022

Municipalities of Klaipeda county	Trees and shrubs greenery area in hectares	Trees and shrubs greenery area in percent
Klaipeda	484.92	4.95
Klaipeda district	2,784.31	2.10
Kretinga district	1,394,56	1,41
Neringa	20.68	0.15
Palanga	326.82	4.13
Silute district	4,452.53	2.65
Skuodas district	1,329.68	1.46

By their very nature, trees and green space provide adventage and add valuation to developments. Preserving trees has affirmative impacts on the image and attractiveness of developments.

Changes in the area of tree and shrub plantations in Klaipeda county.

This paper examines the change in the area of these plantations over 20 years. In Klaipeda county the area under trees and shrubs in 2002 was 4,758.14 ha.

In 2002, an Order of the Minister of Environment of the Republic of Lithuania "On Approval of the Strategy for Protection, Management and Restoration of Green Areas" was adopted, which entered into force in 2003 (Lietuvos Respublikos aplinkos, 2002). This legal document established principles for the protection, management and restoration of green spaces.

In 2007, the Law on Green Areas of the Republic of Lithuania (Law on Green Areas of the Republic of Lithuania, 2007) was adopted. The aim of this Law is to establish a legal framework for the protection, management, creation of green areas and planting of greenery in the territory of the Republic of Lithuania on non-forest land, to ensure the stability of the natural and cultural landscape and the right of the population to environmental conditions that improve the quality of life.

The adoption of this law and the implementation of the strategy stimulated the development of plantations in Klaipeda county. As can be seen from the 1st figure, the analysed area has started to increase since 2007, and in 2022 the plantation area amounted to 10,793.50 ha.

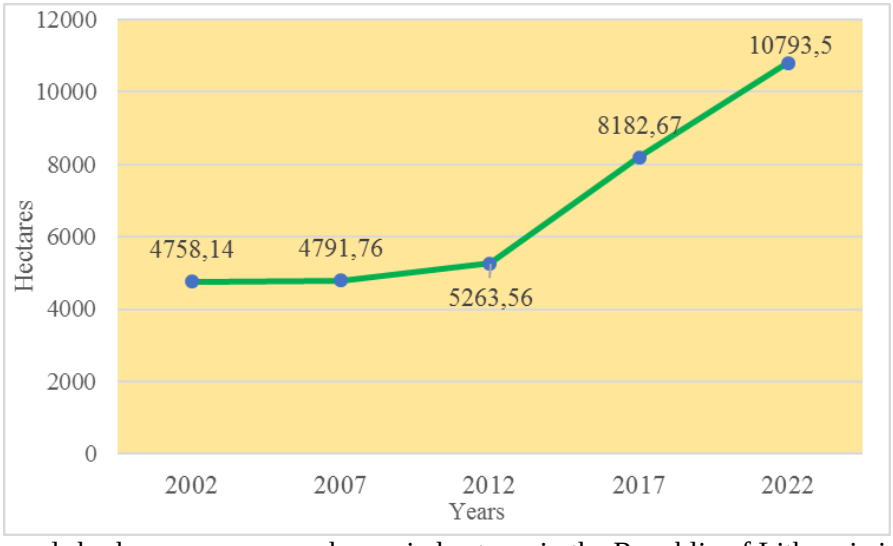


Fig. 1. Trees and shrubs greenery area change in hectares in the Republic of Lithuania in 2002-2022 (Nacionalinė, 2002-2022)

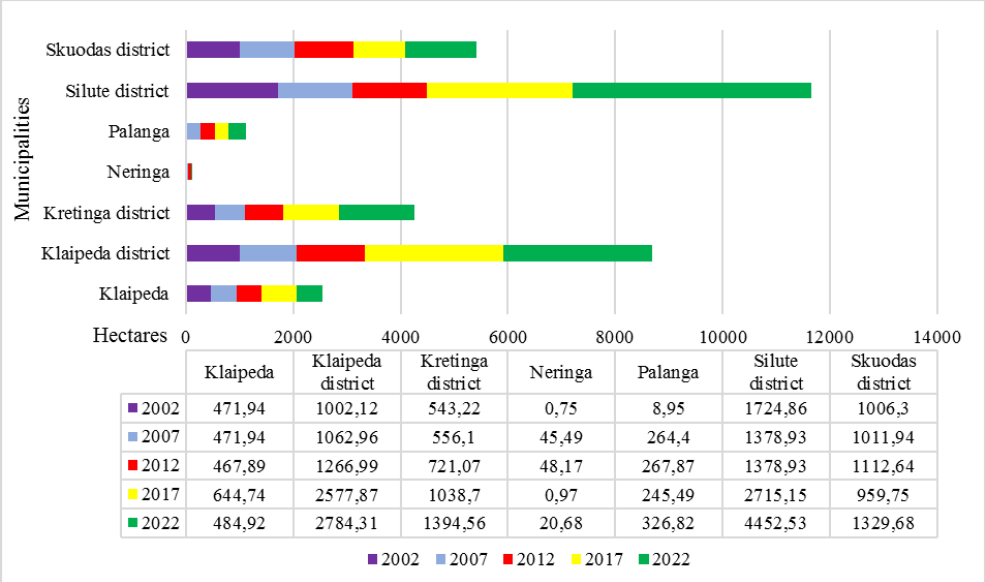
From 2002 to 2022 the area of tree and shrub plantations in Klaipeda county increased by 6,035.36 ha or 126.84 percent. The development of plantation areas has been positively influenced by the creation

of an appropriate legislative framework and the implementation of plantation programmes in municipalities.

Changes in the area of tree and shrub plantations in the municipalities.

Tree and shrub plantations are an important part of the landscape. Planting a trees and shrubs is a great way to help fight climate change. Trees not only act as a carbon store, but they also provide huge benefits to the local environment.

Figure 2 shows that the area of tree and shrub plantations in all municipalities of Klaipeda county has increased from 2002 to 2022. This means that all municipalities in the county have expanded their planted areas over the 20-year period.



	Klaipeda	Klaipeda district	Kretinga district	Neringa	Palanga	Silute district	Skuodas district
2002	471,94	1002,12	543,22	0,75	8,95	1724,86	1006,3
2007	471,94	1062,96	556,1	45,49	264,4	1378,93	1011,94
2012	467,89	1266,99	721,07	48,17	267,87	1378,93	1112,64
2017	644,74	2577,87	1038,7	0,97	245,49	2715,15	959,75
2022	484,92	2784,31	1394,56	20,68	326,82	4452,53	1329,68

Fig. 2. Trees and shrubs greenery area change in hectares in municipalities of Klaipeda county in 2002-2022 (Nacionalinė, 2002-2022)

However, the increase in the area under trees and shrubs was uneven across the municipalities of Klaipeda county (Table 2).

Table 2

Trees and shrubs greenery area change in hectares and percent in municipalities of Klaipeda county in 2002-2022

Municipalities of Klaipeda county	Trees and shrubs greenery area change in hectares	Trees and shrubs greenery area change in percent
Klaipeda	+ 12.98	+ 2.75
Klaipeda district	+ 1,782.19	+ 177.84
Kretinga district	+ 851.34	+ 156.72
Neringa	+ 19.93	+ 2,657.33
Palanga	+ 317.87	+ 3,551.62
Silute district	+ 2,727.67	+ 158.14
Skuodas district	+ 323.38	+ 32.14

The analysis shows that in the period between the years 2002 and 2022 the biggest increase in the area in hectares of shrubs and plantations took place in Silute district (2,727.67 ha) and Klaipeda district (1,782.19 ha), and the smallest increase in Klaipeda municipality (12.98 ha).

However, when analysing the change data in percentages, it can be seen that the most changes are in the municipality of Palanga (3,551.62 percent), the least in Klaipeda municipality (2.75 percent).

The European Union biodiversity strategy for 2030 (Communication, 2020) is a comprehensive, ambitious and long-term plan to protect nature and reverse the degradation of ecosystems. The strategy aims to put Europe's biodiversity on a path to recovery by 2030, and contains specific actions and

commitments. Also, biodiversity strategy encourages bringing nature back into cities by creating biodiverse and accessible green infrastructure. The strategy also emphasizes the importance of developing urban greening plans in cities and towns.
After the implementation of the EU Biodiversity Strategy and the legal acts of the Republic of Lithuania, as well as greenery area development projects in municipalities, it is expected that the area of trees and shrubs greenery will increase.

Conclusions

1. In 2022, tree and shrub plantations in Klaipeda county covered 10,793.50 ha, accounting for 2.07 percent of the county's area.
2. An analysis of the area of tree and shrub plantations in Klaipeda municipalities shows that the largest number of trees and shrubs is found in Silute (4,452.53 hectares) and Klaipeda (2,784.31 hectares) districts, while the smallest number of trees and shrubs is found in the municipality of Neringa (20.68 hectares or 0.15 percent).
3. From 2002 to 2022 the area of tree and shrub plantations in Klaipeda county increased by 6,035.36 ha or 126.84 percent. The development of plantation areas has been positively influenced by the creation of an appropriate legislative framework and the implementation of plantation programmes in municipalities.
4. The analysis shows that in the period between the years 2002 and 2022 the biggest increase in the area in hectares of shrubs and plantations took place in Silute district (2,727.67 ha) and Klaipeda district (1,782.19 ha), and the smallest increase in Klaipeda municipality (12.98 ha). However, when analyzing the change data in percentages, it can be seen that the most changes are in the municipality of Palanga (3,551.62 percent), the least in Klaipeda municipality (2.75 percent).

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