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ВИЗНАЧЕННЯ СТРАТЕГІЧНИХ НАПРЯМІВ І РОЗРОБКА ПРОПОЗИЦІЙ ЩОДО РОЗВИТКУ УРБОЛІСУ ДЛЯ ПРИМОРСЬКИХ МІСТ

Актуальність. *Розвиток територій зі сприятливим реабілітаційним впливом та екологічним значенням в приморських містах Україні є важливим аспектом збереження привабливості південних регіонів в післявоєнний період. Адже під час та після війни значна частка населення потребуватиме сприятливого середовища для відновлення психіки, а приморські міста потребуватимуть стратегії щодо розширення рекреаційних пропозицій. Значний рекреаційний потенціал мають зелені зони міст. Їх переваги полягають в тому, що, на відміну від пляжних ресурсів, вони придатні для територіального розширення та можуть розвиватись у будь-якій точці міста. У контексті пошуку універсального підходу щодо розвитку зелених зон особливої привабливості набуває концепція урболісу, як єдиної системи всіх зелених насаджень. Тому для визначення стратегічних напрямів і пропозицій щодо розвитку урболісу у приморських містах, необхідно визначити основні економічні, соціальні та характерні природні умови, які матимуть вирішальний вплив.*

Мета та завдання. *Метою дослідження є розробка стратегічних напрямів і пропозицій щодо розвитку урболісу в приморських містах на основі SWOT/TOWS – аналізу взаємозв'язків сильних сторін та можливостей, слабких сторін та можливостей, слабких сторін та загроз, сильних сторін та загроз міських лісів у приморських містах.*

Матеріали та методи. *При проведенні дослідження були використані загальнонаукові та спеціальні методи: системний аналіз, синтез та теоретичне узагальнення, SWOT/TOWS – аналіз. Інформаційним базисом для проведення дослідження стали наукові доробки вітчизняних та зарубіжних колег, інформаційні та аналітичні матеріали, нормативно-правові акти України.*

Результати. *В роботі обґрунтовано концептуальні відмінності розуміння міських лісів в Україні та розвинутих зарубіжних країнах, що є підставою для запозичення кращого досвіду щодо розвитку міських лісів та їх ролі в суспільстві. Основним результатом дослідження є розробка пріоритетних напрямів та пропозицій щодо розвитку урболісу у приморських містах, які отримано на основі аналізу нормативно-правових документів України стосовно розвитку міських лісів, актуальних економічних проблем, а також природно-кліматичних особливостей півдня України.*

Висновки. *Ефективне управління міськими лісами на основі екосистемного підходу відіграє важливу роль не лише для природоохоронної сфери, але і для суспільного благополуччя. На основі проведеного SWOT/TOWS – аналізу актуальних проблем розвитку урболісу для приморських міст в Україні, запропоновано стратегічні напрями розвитку міських лісів та міського лісового господарства, які включають наступне: розбудову мережі міських лісів та національного міського лісового господарства; налагодження моніторингу міських лісів та сприяння відкритості інформації; сприяння науковим дослідженням міських лісів на основі міждисциплінарного підходу; впровадження адаптивного управління міськими лісами; створення умов для розвитку фахівців сфери міських лісів. Таким чином, розвиток міських лісів має бути дотичним до наступних організаційно-економічних аспектів устрою міського простору: норм землекористування; соціальних та економічних чинників щодо актуальних напрямів розвитку громадських просторів; діючих місцевих програм розвитку територій; природних передумов та особливостей ландшафту.*

Ключові слова: *рекреаційні ліси, міські ліси, природні активи, приморські міста, лісівництво.*

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DEFINITION OF STRATEGIC DIRECTIONS AND DEVELOPMENT OF PROPOSALS FOR THE DEVELOPMENT OF URBAN FOREST FOR COASTAL CITIES

Topicality. *The development of territories with a favorable rehabilitation impact and ecological significance in coastal cities of Ukraine is an important aspect of preserving the attractiveness of the southern regions in the post-war period. After all, during and after the war, a significant proportion of the population will need a favorable environment for mental recovery, and coastal cities will need a strategy for expanding recreational offers. Green zones of cities have significant recreational potential. Their advantages are that, unlike beach resources, they are suitable for territorial expansion and can be developed in any part of the city. In the context of the search for a universal approach to the development of green zones, the concept of urban forest, as a single system of all green spaces, becomes particularly attractive. Therefore, to determine strategic directions and proposals for the development of urban forests in coastal cities, it is necessary to identify the main economic, social, and characteristic natural conditions that will have a decisive influence.*

Aim and tasks. *The purpose of the study is to develop strategic directions and proposals for the development of urban forests in coastal cities based on SWOT/TOWS analysis, which examines the relationships between strengths, weaknesses, opportunities, and threats of urban forests in coastal cities.*

Materials and methods. *When conducting the study, general scientific and special methods were used: system analysis, synthesis and theoretical generalization, SWOT/TOWS - analysis. The information basis for the study was the scientific achievements of domestic and foreign colleagues, information and analytical materials, normative and legal acts of Ukraine.*

Research results. *The work substantiates the conceptual differences in the understanding of urban forests in Ukraine and developed foreign countries, which is the basis for borrowing better experience in the development of urban forests and their role in society. The main result of the study is the development of priority areas and proposals for the development of urban forests in coastal cities, which were obtained based on the analysis of regulatory and legal documents of Ukraine regarding the development of urban forests, current economic problems, as well as the natural and climatic features of southern Ukraine.*

Conclusion. *Effective management of urban forests based on an ecosystem approach plays an important role not only for the environmental field, but also for public well-being. Based on the SWOT/TOWS analysis of the current problems of urban forest development for coastal cities in Ukraine, strategic areas for the development of urban forests and urban forestry are proposed, which include the following: building a network of urban forests and national urban forestry; establishing monitoring of urban forests and promoting openness of information; promoting scientific research on urban forests based on an interdisciplinary approach; implementing adaptive management of urban forests; training specialists in the field of urban forests. Thus, the development of urban forests should be related to the following organizational and economic aspects of the organization of urban space: land use norms; social and economic factors regarding current directions of development of public spaces; existing local territorial development programs; natural prerequisites and landscape features.*

Keywords: *recreational forests, urban forests, natural assets, coastal cities, forestry.*

Problem statement and its connection with important scientific and practical tasks. Regarding the concept of urban forest, there is currently a certain inconsistency between its understanding and interpretation in the practice of Western European countries and Ukraine. In European countries and the USA, an urban forest includes all green spaces in the city, including single trees. In Ukraine, the concept of an urban forest is taken literally - as a forest area in an urban environment, including forest parks. Due to such differences, strategic directions and measures for the development of urban forests in developed countries and in Ukraine differ significantly.

Today, there is an international forest policy in the world, which also affects urban forests. Among the widespread regular documents on forest development in the world are the United Nations Forum on Forests (UNFF) and the World Forestry Congress (WFC). Among the non-regular documents on forest development are the New York Declaration on Forests, the United Nations Strategic Plan for Forests and the World Forum on Urban Forests. (Park et al, 2023). All of them are aimed at promoting the sustainable development of all types of forests, strengthening cooperation and coordination, as well as preserving forest resources. On May 30, 2024, the Cabinet of Ministers of Ukraine issued an order "On approval of the Strategy for the formation and implementation of state policy in the field of climate change for the period until 2035 and approval of the operational plan of measures for its implementation in 2024-2026". Among the approved plan of measures, one can distinguish those that directly relate to forestry and indicate the importance of urban forests in achieving the Strategy, namely: adaptation of forestry to climate change; assessment of risks and vulnerability of forests and forestry to climate change (which will have specifics for urban forests); increasing the resilience of settlements to climate change (which is directly related to the regulating

services of urban ecosystems and the provision of green zones), and other tasks. Thus, borrowing foreign experience in the development of urban forests will allow better adaptation of the regulatory and management sphere to the best global practices of green economy management, and will also expand opportunities for participation in international strategic plans.

Analysis of recent publications on the problem. Today, there are studies that substantiate the benefits of urban forest for humans and its ecological functions that it provides to the city as a whole (O'Brien et al, 2022; Zhou et al, 2021). The most common studies are devoted to the role of urban forests in overcoming climate change and adapting to these changes in urban space (Nowak et al, 2018; Nortona et al, 2015), which is extremely relevant in the context of the rapid pace of climate change and the vulnerability of urban residents to its consequences.The high rates of urbanization and urban population growth have provoked another topical topic of modern research – recreational conflicts in urban forests and their forecasting factors (Arvidsen et al, 2024; Kleiner, 2022; Manning, 2022; Wolf et al, 2018)

Also interesting from a scientific and practical perspective are some irregular documents, such as the World Forum on Urban Forests, which was held in Italy in 2018. According to the forum, by 2050, 68% of the population will live in cities, which poses urgent tasks for improving the urban environment and improvement its organoleptic qualities (JA & OTO, 2018). In this regard, the development of urban forests is considered an important component of urban adaptation to climate change and improving the conditions of human existence in the urban environment. Therefore, urban forests are a natural asset that brings benefits in the form of social and economic goods, as well as improving the ecological state of urban space. For more detailed justification of the conceptual vision of the development of urban green spaces as natural assets, see the previous study (Khumarova & Vernihorova, 2024). It substantiates the types of urban parks by the degree of impact on the socio-economic space of the city, which can also be applied to urban forests.

The issue of urban forest development cannot be considered in isolation from economic prerequisites and interests. One of the significant problems in the development of green spaces in Ukraine is the lack of funding, which requires the search and justification of effective economic instruments for attracting funds. Therefore, in another work, the author substantiated the feasibility of using the instrument of public-private partnerships in the development of green spaces, and also substantiated their benefits for the local and state budgets using the example of a hypothetical investment project (Yankovyi & Vernihorova, 2024). Therefore, it is the economic component of the issue of urban forest development that today requires special attention in the conditions of post-war recovery, and has prospects for finding innovative solutions.

Allocation of previously unsolved parts of the general problem. The concept of an urban forest and regulatory requirements for its development are completely absent important regulatory documents regarding greening, namely: in DBN B.2.2-12:2018 "Planning and Development of Territories", the Law of Ukraine "On Improvement in Settlements" of 2005, and in the "Standard Rules for Improvement of the Territory of a Settlement", the Ministry of Regional Development, Construction and Housing and Communal Services of Ukraine, dated 11/27/2017.

The issue of the status of urban forests in Ukraine was studied in detail by domestic scientists (Sakhanienko, & Kolisnichenko, 2022), highlighted the problems caused by this uncertainty: low quality of economic and managerial support, lack of funding, low degree of interaction between the State Forest Agency and local governments, and other problems.

In addition to the already listed problems of developing the concept of urban forest in Ukraine, as well as its implementation in the practice of landscaping, the issues of developing green spaces in coastal cities, the features and challenges associated with climatic factors and the specifics of coastal regions also remain poorly studied. A significant part of the research on the development of urban forests mainly concerns the western part of Ukraine (Drahun et al, 2021; Kovalchuk et al., 2021; Shukel & Hlohovskyi, 2024), as well as the general issue of developing urban forests (Sakhanienko & Kolisnichenko, 2022; Orlovska & Pavlenko, 2024).

Formulation of research objectives (problem statement). The purpose of the study is to develop strategic directions and proposals for the development of urban forests in coastal cities. To achieve this goal, the following tasks were set within the framework of the study: to analyze the main problems and features inherent in urban forests according to the experience of foreign practice; to conduct a SWOT analysis of the development of urban forests; SWOT/TOWS analysis, how the selected factors (strengths, opportunities, weaknesses and threats) influence each other and the choice of further strategies for the development of urban forests in coastal cities.

Materials and methods. The theoretical basis of the study is the scientific works of domestic and foreign scientists on the development of urban forests, as well as information from open sources on foreign experience in this field. To achieve the goal of the study, SWOT/TOWS analysis methods were outlined, which are most appropriate in the development of strategic directions and proposals. The SWOT analysis method allows you to demonstrate the current state of the problem under study and determine the prospects for its further solution. SWOT analysis is widespread in the development of the business environment (Kopchak et al, 2024), but in recent years it has also spread in research in the field of environmental economics, for example, in work on the strategic management of the Nobel National Nature Park (Shershun et al, 2023), as well as environmental safety (Arkhyp et al, 2024).

The combination of SWOT and TOWS analysis methods can be found in the work of domestic colleagues (Shershun et al, 2023; Pankiv et al, 2024), which we take as an example of their joint application. Since the purpose of our study is to develop strategic directions for the use of natural assets of urban parks in coastal cities, TOWS analysis is extremely relevant for us. The successful application of this type of analysis in identifying strategic directions can be found in many scientific works, for example, on the competitiveness of the enterprise (Shevchenko, 2013), and other areas of economic research.

An outline of the main results and their justification. Today, there is an international forest policy in the world, which also affects urban forests. Among the regular documents, we can mention (the United Nations Forum on Forests (UNFF) and the World Forestry Congress (WFC). Among the non-regular documents are the New York Declaration on Forests, the United Nations Strategic Plan for Forests and the World Forum on Urban Forests (Park et al, 2023). All of them aim to promote the sustainable development of all types of forests, strengthen cooperation and coordination, and conserve forest resources. The most interesting among them is the World Forum on Urban Forests, which was held in Italy in 2018. According to the forum, by 2050, 68% of the population will live in cities, which poses urgent tasks for improving the urban environment and organoleptic qualities (JA & OTO, 2018; World Urban Parks, 2024).

On May 30, 2024, the Cabinet of Ministers of Ukraine issued a decree "On approval of the Strategy for the formation and implementation of state policy in the field of climate change for the period up to 2035 and approval of the operational plan of measures for its implementation in 2024-2026. Some of the expected results specified in the Strategy can be achieved, including through the organizational and economic support of urban forests. Among them, the following can be distinguished:

- increasing the resilience of infrastructure and settlements to climate change;
- strengthening the resilience of the health sector to climate change, as well as reducing the level of morbidity and mortality associated with climate change, especially in the most vulnerable territorial communities;
- strengthening the protection of cultural heritage from the impact of climate risks.

As for the conceptual provisions, today a broad understanding of the urban forest is widespread in foreign practice. For example, the Canadian Urban Forest Strategy for 2019–2024 provides the following definition of urban forests: "trees, forests, green spaces and associated abiotic, biotic and cultural components in areas extending from the urban core to the urban and rural boundaries" (Bachinger et al, 2023).

As for Ukrainian legislation, Section 2 of the Rules for the Maintenance of Green Spaces in Settlements of Ukraine (2006) states that an urban forest is "a forest massif or a forest area located within the boundaries of a settlement."

The definition of urban forests in the Canadian Urban Forest Strategy for 2019–2024 is based on an ecosystem approach, as all green spaces in the city, regardless of their ownership, are considered an ecosystem with a common beneficial effect on the urban environment. The most practical solutions and scientific approaches to the development of urban forests can be found in the experience of countries such as the USA, Canada, and Sweden, which is due to the significant degree of forest cover in these countries.

The city of Philadelphia (USA) was once built in the middle of a forest, with the use of clearing the territory using felling. In the period from 1950 to 2020, the city experienced significant fluctuations in population, which led to the formation of unreliable areas in the city during periods of population decline and the formation of areas of wild thickets with a low level of improvement. These areas were characterized by social danger due to their high attractiveness to criminal segments of society. Currently, the city of Philadelphia is multinational and one of the largest cities in the United States in terms of size. The city has a very diverse nature of the development of green spaces in different areas, which is a component of social injustice regarding the availability of green spaces

for residents of different social groups and nationalities. The Philadelphia Parks and Recreation Areas Department is responsible for the care and planting of green spaces. At the same time, formally, trees on city streets belong to the owners of adjacent real estate, and they are responsible for their condition and safety (City of Philadelphia, 2023; Grant et al, 2024). In connection with the reduction of expenses in the field of greening, society is encouraged to take part in landscaping and maintenance of plantations. Therefore, the following programs operate in Philadelphia, through the activities of which city residents play a key role in growing an urban forest:

The "Tree Philly" tree distribution program (since 2012) - specializes in creating partnerships with local community organizations and volunteer groups in areas where there is a shortage of trees, with the purpose of increasing their number. Trees are distributed to city residents for further planting;

The "Tree Tenders" tree planting and care program (since 1993) - within the framework of the program, tree seedlings are provided to city residents and training is provided in advanced planting and care methods. Those residents who complete the training receive a certificate and become volunteers in improvement of green areas, and have the right to form a group to further increase the number of plantings (Grant et al, 2024).

Another example of the experience of developing urban forests is the activities of the national Canadian non-profit Tree Canada Organization, which specializes in planting trees and their care in urban and rural environments. The organization collaborates with all levels of government, utility companies and citizens to involve residents in planting trees. The main mission of the organization is to contribute to solving climate change problems and improving the quality of life. Interestingly, Tree Canada is the secretariat of the Canadian Urban Forest Strategy, which in its activities highlights five main strategies (Bachinger et al, 2023):

- Building the capacity of national urban forestry;
- Communication and public education;
- Research, approaches, and technologies for urban development;;
- Forest planning and management;
- Professional development.

The experience of using electronic applications to provide and monitor information on the qualitative and quantitative characteristics of urban forests is interesting. For example, in the USA, the following applications are available, developed by the Forest Service (U.S. Department of Agriculture, 2019):

i-Tree Canopy – allows you to assess tree cover and soil types using Google Maps aerial photography. The application allows the user to highlight an area of interest on the map and obtain characteristics of tree cover and soil types in a specific area in percentage terms;

i-Tree Landscape – an electronic tool that displays information on green spaces and demographic indicators according to the census. Allows you to compare demographic information in the selected area with green space data. The tool is designed to demonstrate the interaction of humans and green spaces. It can be used for more effective management of urban forests, allows you to assess tree ecosystem services and allows you to determine priority management measures taking into account demographic data;

Trees and Health app – contains detailed data on tree cover, demographics, air quality, and urban heat islands for 13 US cities. Allows you to assess and compare data to identify risks, priorities, and the number of trees needed to improve the lives of residents.

The presented experience of developing urban forests concerns areas with a high degree of forest cover. However, in the broad sense of urban forests as a set of all green spaces in the city, this concept can also be developed in areas with a low degree of forest cover. Such areas include the coastal regions of southern Ukraine. In addition, in conditions of arid climate and high air temperatures in the summer, urban forests become particularly relevant in the context of increasing recreational attractiveness. For example, the rehabilitation and tourism potential of the city of Odessa can be significantly increased by ensuring a high level of greenery. Thus, there is a study by Korean colleagues on the levels of native antimicrobial substances of plants concentration in the air of different types of green spaces. According to the data, air analysis in different green spaces allowed them to classify recreational forests into four categories: natural recreational forests, arboretums, forest parks, and city parks (Lee et al, 2015). The highest concentrations of phytoncides were observed in natural forests, compared to other plantations. Studies also note the role of microclimatic factors in the healing properties of green spaces. Higher concentrations of phytoncides in the environment are promoted by such microclimatic factors as increased humidity and air temperature, as well as soil temperature (Choi et al, 2021). A decrease in the concentration of phytoncides was associated with photosynthetically active solar radiation (PAR), as well as increased

wind speed (Lee et al, 2015). Thus, urban forests in the coastal cities of southern Ukraine have a high rehabilitation potential, and with proper organizational structure from the point of view of rehabilitation, they can be considered a healing asset.

In addition, in the field of public administration today there is a concept of recreational forests, which means "forest areas with recreational and health-improving functions, and are used for tourist, sports, health-improving and recreational purposes and are located within settlements and green zones around settlements" (Lviv Regional Department of Forestry and Hunting, 2025). Therefore, the further development of urban forests from the point of view of their therapeutic and rehabilitation properties is becoming more relevant.

For the purpose of developing strategies for the development of urban forests for coastal cities, a SWOT analysis of the institutional, economic, and ecological fields was conducted, and the weaknesses and strengths of the development of urban forests were identified (Table 1).

Table 1

SWOT analysis of the institutional, economic, and environmental spheres regarding the development of urban forests for coastal cities of Ukraine

Strengths (S)	**Favorable opportunities (O)**
- population health; - development of weekend tourism and recreation in cities; - development of recreational areas alternative to sea recreation; - increasing the recreational potential of the city in the high season; - balance of environmental and economic interests; - promising areas for green investments	- decentralization and development of local communities; - "green" European course; - global trends; - green urbanism and adaptation to climate change; - attractiveness of coastal areas for recreational and tourist development; - development of eco-network
Weaknesses (W)	**Threats (T)**
- undeveloped legislative and regulatory framework; - lack of environmental incentives; - lack of experience in the development and functioning of urban forests; - lack of innovative approaches in the development of urban green economy; - unformed recreational and tourist interest of urban forests; - lack of economic interest; - interpretation of urban forests in a narrow sense	- arid climate; - deterioration of the ecological state of coastal cities due to military operations; - potentially high probability of destruction of ecosystems due to seasonal fires; - associative connection of coastal cities only with sea recreation; - lack of the concept of urban forest in the development strategies of regions and cities; - insufficient financing of green urban economy; - impossibility of applying public-private partnership to forests on communally owned lands, due to current legislation; - escalation of military conflict

Source: author's development

Thus, we have identified the factors of strengths and weaknesses, and threats and opportunities in the field of urban forest development in coastal cities. So let's analyze the relationships between the identified factors using SWOT/TOWS analysis, which allows us to determine how the selected factors affect each other and the choice of further strategies for the development of urban forests in coastal cities.

All relationships of SWOT/TOWS analysis can be divided into four large groups:

– comparative advantages (which contribute to maintaining strengths);

– challenges (contribute to reducing weaknesses);

– risks (strengthening weaknesses);

– countering threats.

Figure 1 presents the relationships of strengths and opportunities that form comparative advantages in the field of urban forest development in coastal cities. Using these relationships, it is possible to identify promising directions for the development of urban forests that will contribute to economic, social and ecological benefits. A solid line denotes a strong relationship, and a dotted line denotes a weak relationship. We also represent feedback relationships – bold lines are dotted.

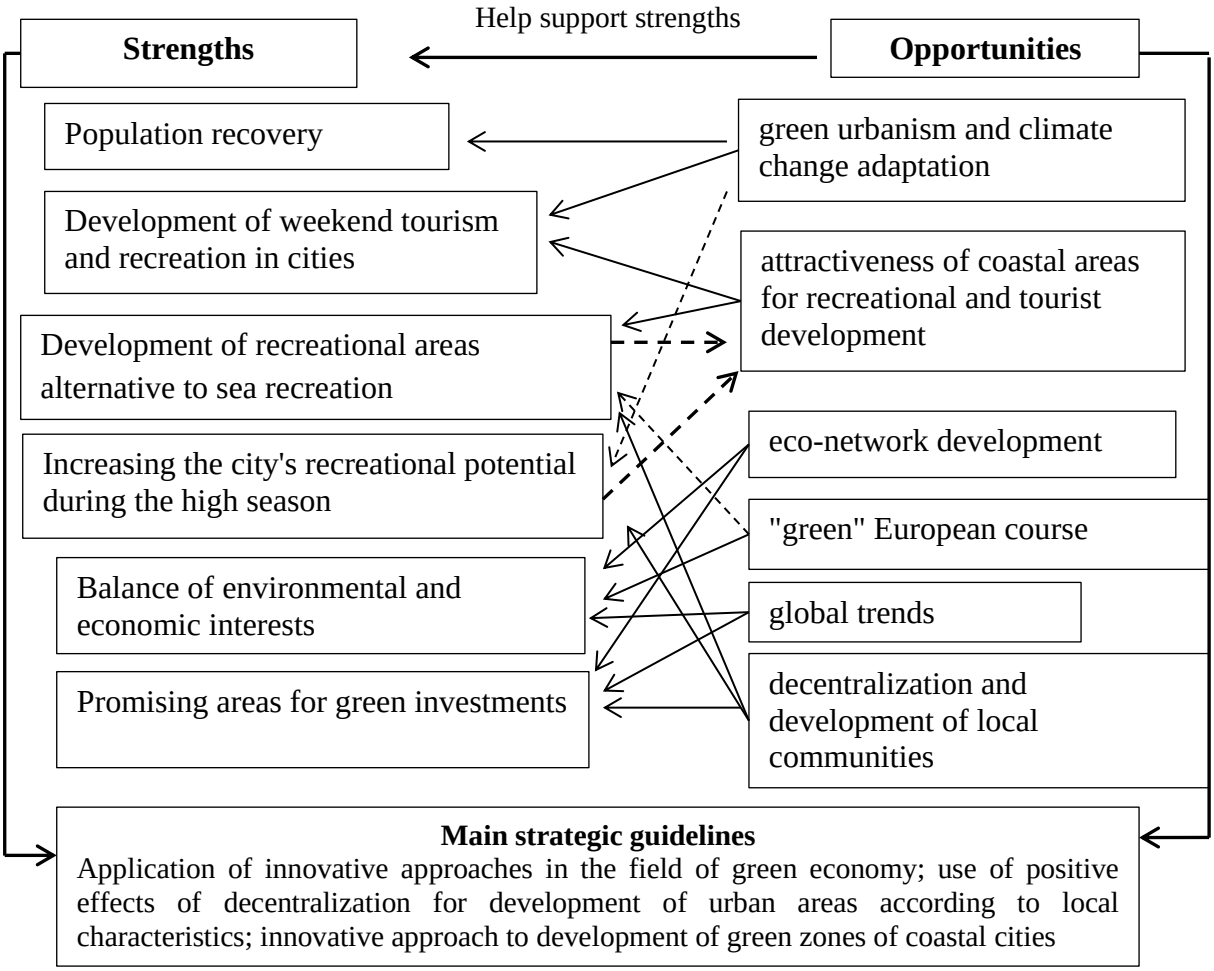

Fig. 1. Relationships of SWOT analysis factors that form comparative advantages and the main strategic guidelines for the development of urban forest

Source: compiled by the author, according to the methodological approach in the works (Shershun et al, 2023; Pankive et al, 2024).

Thus, the following comparative advantages can be identified for the development of urban forests in the territory of coastal cities, which can be used as the basis for strategic directions:

- the application of innovative practices for the management and improvement of green urban management, practices of green urbanism and general trends of the green European course in the regulatory, legal and ecological and economic spheres will contribute to the trends towards an increase in the total area of green spaces and the development of poorly developed greening facilities, such as: urban forests, micro-parks;

- decentralization and development of local communities will contribute to the development of urban forests in the context of the characteristics of coastal cities and the interests of communities: the development of investment projects and green investments. Of particular interest is the increase in the recreational attractiveness of cities and the development of alternative recreation to the sea;

- the attractiveness of coastal areas for recreational and tourist development will contribute to the objects of recreational demand, which include green spaces of public importance.

Next, let's look at the challenges that arise from the interaction of weaknesses and opportunities (Figure 2):

Therefore, the challenges of urban forest development in coastal cities are as follows:

- the underdeveloped regulatory framework for the development of urban forests and their narrow interpretation (as forest areas in the city) can be significantly improved based on foreign experience;

- development of the concepts of urban forest and urban forest in domestic regulatory documents regarding the development of the ecological network;

- determination of the place of green spaces of cities, parks, squares and forest parks in the system of the national ecological network and increasing the level of research on this issue;

- development of green urbanism and innovative solutions for adapting cities to climate change, which will create additional environmental incentives for the development of urban forests and offer foreign experience in their development and functioning. The application of foreign experience allows us to interpret urban forests in a broader sense - as a set of all existing green spaces of the city, and will contribute to the formation of a single strategy for all green zones;

- decentralization and development of local communities in combination with global trends allow to form a recreational and tourist image of urban forests taking into account the peculiarities of the local tourism sector and increase economic interest in their development;

- formation of a tourist image of urban forests and urban forest in general, using effective foreign practices. In the context of the post-war reconstruction of Ukraine and the economical use of natural ecosystems, it would be relevant to pay attention to foreign experience in creating medicinal forests, such as in Denmark, Korea, Japan, and developing medicinal practices in forests as in Austria.

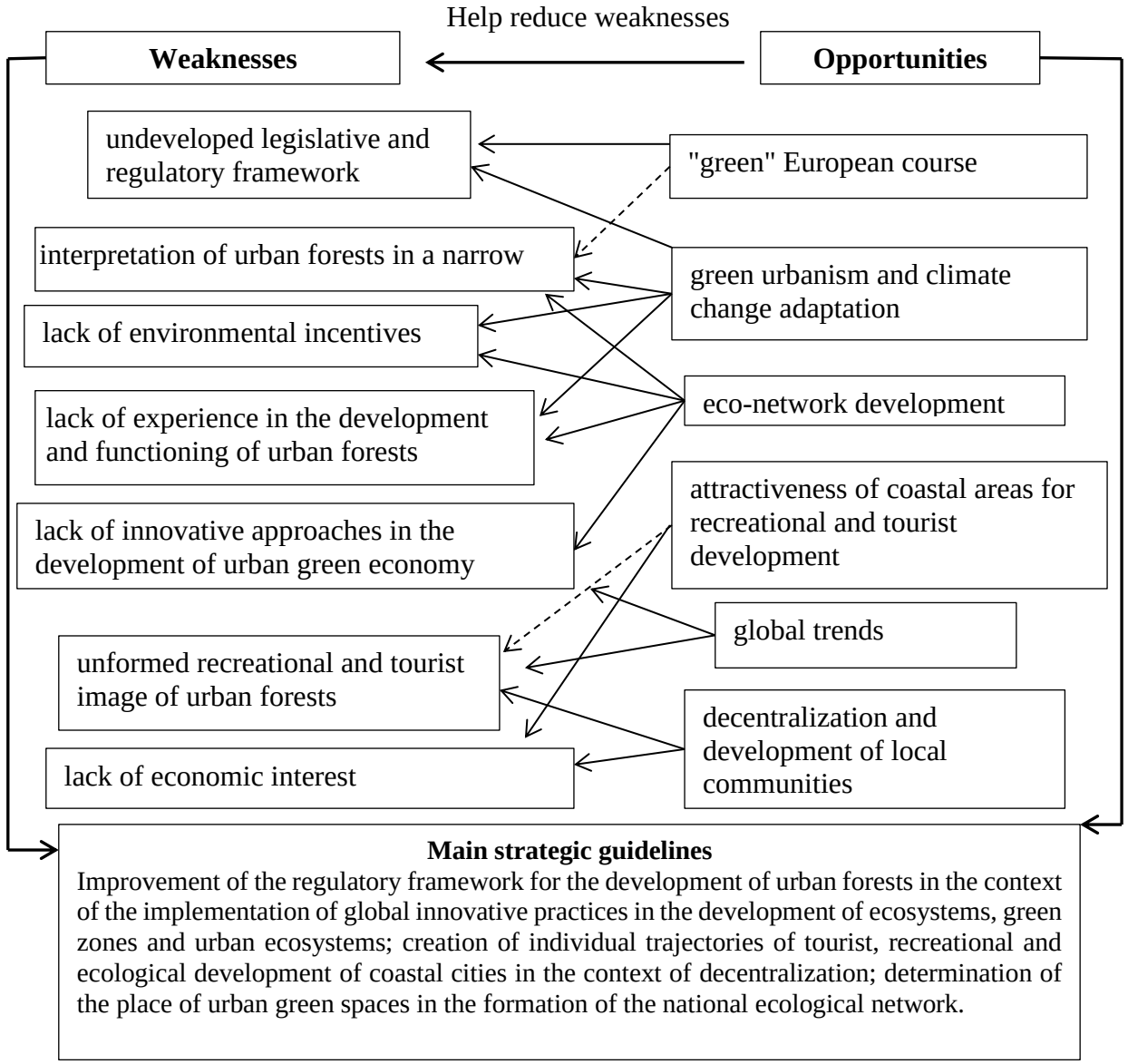

Fig. 2. Relationships of SWOT analysis factors that form challenges and the main strategic guidelines for the development of urban forest

Source: compiled by the author, according to the methodological approach in the works (Shershun et al, 2023; Pankive et al, 2024).

As we can see, in the field of urban forest development, a sufficient number of challenges are being formed, which are associated with increasing the innovativeness of the urban green economy system and environmental policy in general.

The prospects for the development and use of natural assets of urban forests largely depend on the ability to overcome risks that are formed by a combination of threats and weaknesses of this area. Therefore, let us consider the risks below, as well as the main strategic guidelines related to overcoming them (Figure 3):

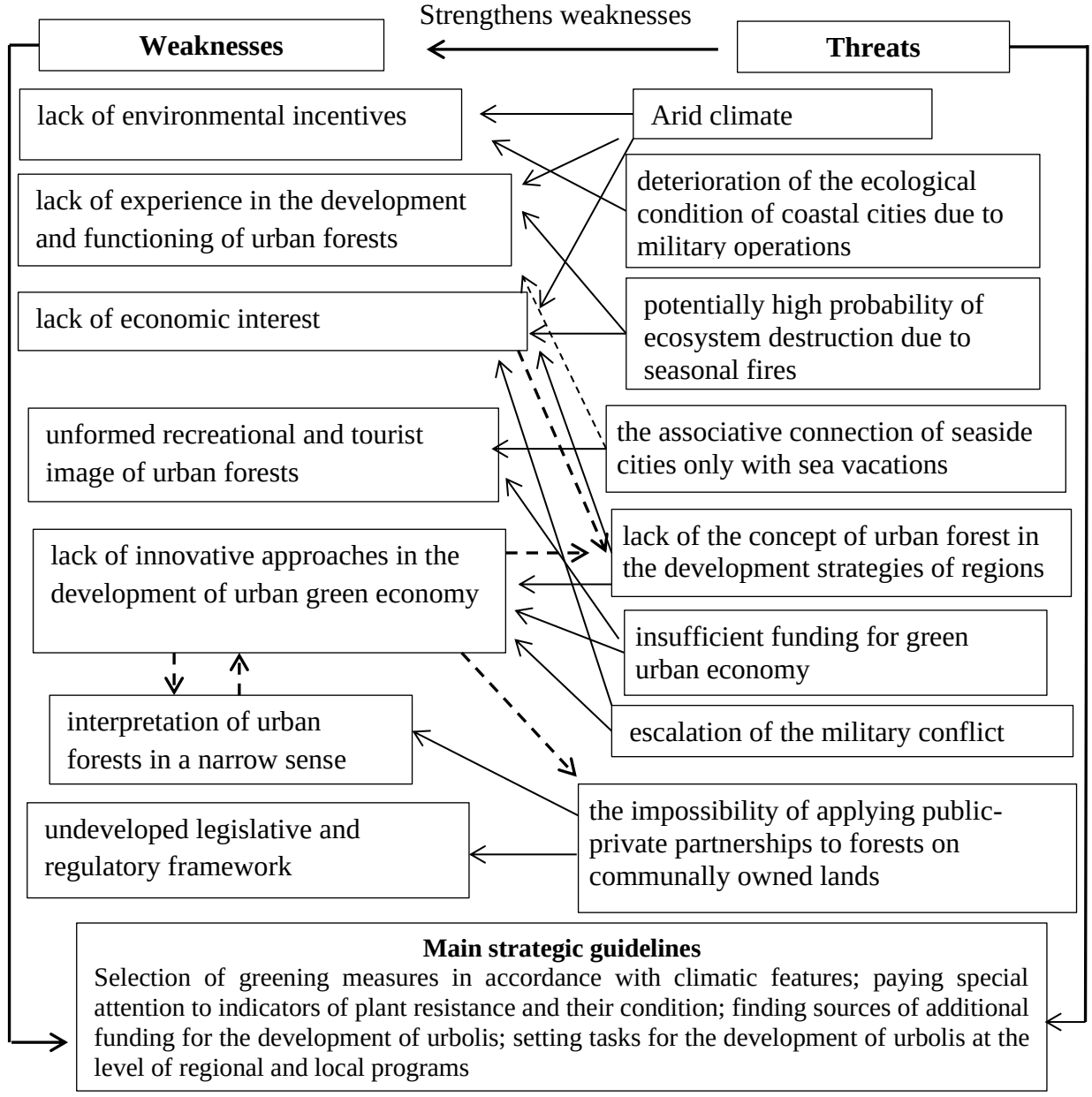

Fig. 3. Relationships of SWOT analysis factors that form risks and the main strategic guidelines for the development of urban forest

Source: compiled by the author, according to the methodological approach in the works (Shershun et al, 2023; Pankive et al, 2024).

Thus, the following risks of the development of urban forests in the coastal cities of Ukraine can be identified:

- the arid climate requires careful care for green spaces, especially seedlings, which is expensive over a large area, which is why there is no economic and environmental interest in creating forests on the territory of coastal cities for the south of Ukraine;

- deterioration of the quality of the natural environment as a result of military operations contributes to chemical damage to plants, their diseases and drying out;

- insufficient financing of green economy as a whole leads to the lack of an innovative approach to the development of urban forest and the lack of their recreational and tourist image for coastal cities;

- the concept of an urban forest is not included in local improvement and development programs, therefore these forests remain outside of economic interest and outside of innovative solutions in the field of nature management. For coastal cities, the greatest interest is the development of coastal areas, but by focusing only on marine ecosystems, we lose their interconnection with terrestrial ecosystems, which can attract additional vacationers and increase the recreational potential of the city;

- for the development of innovative approaches to the functioning of the urban forest, timely monitoring and accounting of the city's green spaces is important, which would systematize information on the quality and condition of the spaces and responsible balance holders.

In order to understand what strengths of the natural assets of the urban forest can be used to counteract threats, we will compare them (Figure 4). It is important that the strengths outweigh the threats, then in addition to the social and environmental justification of the benefits of urban forests, they will also have an economic justification for their development. The most important advantage of the development of natural assets of the urban forest is that they can be considered as objects of "green" financing, which is associated with the need to allocate part of market resources to maintain favorable environmental and climatic conditions. That is, in the context of the development of the urban forest, financing of projects and programs for the development of urban forests can be considered as "green" financing, with the aim of improving the quality of the urban environment, microclimatic parameters, as well as a favorable impact on the health of the population.

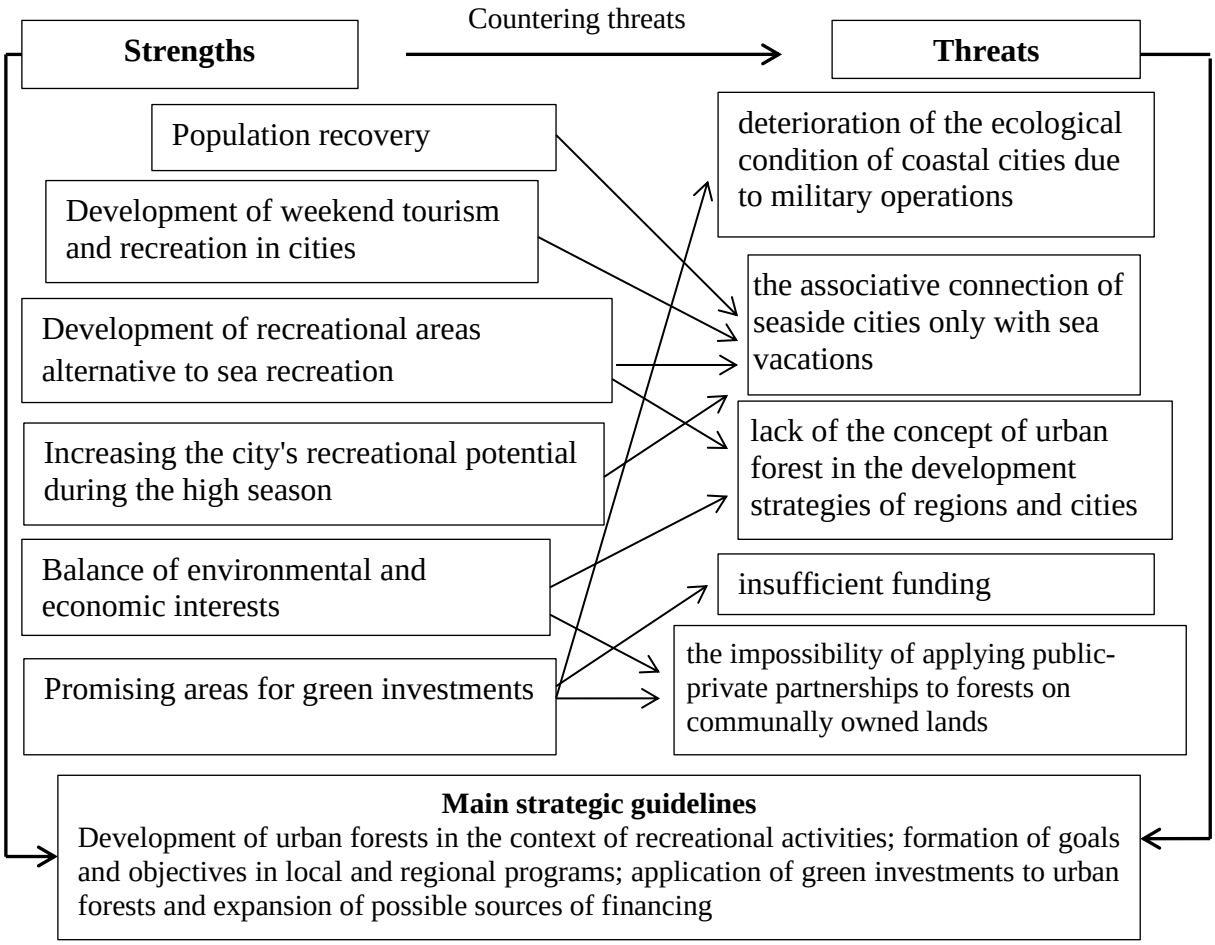

Fig. 4. Relationships of SWOT analysis factors that counteract threats and the main strategic guidelines for the development of urban forest

Source: compiled by the author, according to the methodological approach in the works (Shershun et al, 2023; Pankive et al, 2024).

Thus, the following measures can be identified to counter threats using the strengths of the development of urban forests (urban forests) in coastal cities of Ukraine:

- taking into account the prospects of urban forests and urban forests as objects for green investments, local and regional problems associated with the deterioration of the ecological state of coastal cities can be improved, and this is also a basis for revising the legislation on the possibility of applying partnership agreements for municipally owned urban forests;

- the development of the tourist and recreational attractiveness of urban forests in the territory of coastal cities will significantly contribute to the expansion of recreational offers and to some extent increase the interest of tourists;

- the formation of goals and objectives for the development of urban forests at the local and regional levels in the context of recreational development will contribute to increasing the economic and environmental attractiveness of urban forests and the development of regulatory provisions for both urban forests and urban forests at the legislative level.

Based on the SWOT/TOWS analysis of current problems of urban forest development in Ukraine, the following strategic directions for the development of urban forests and urban forestry can be proposed:

1. Development of a network of urban forests and national urban forestry, which has the following goals:

- Improving the regulatory framework for urban forests and introducing the concept of "urban forestry";

- Introducing the concept of "urban forest", or urban forest in the broad sense of its meaning – as a set of all green spaces in the city. At the same time, it is important to leave the existing concept of urban forests as forest areas in the city, and to make amendments to the Forest Code of Ukraine, which allow for the conclusion of partnership agreements for municipal forests in the territory of cities;

- Strengthening the participation of regional and city governments, as well as municipal institutions, in urban forestry;

- Instruct urban communities to develop and implement comprehensive strategic plans for urban forest management;

- Establish cooperation between responsible urban forest management bodies (municipal utilities and forest park administrations) with related sectors, such as: municipal enterprises for the improvement of urban green spaces, public environmental organizations; recreation and tourism management bodies; medical institutions for rehabilitation and balneology.

2. Establishing monitoring of urban forests and accessible information provision. Objectives:

- Establishing monitoring of all natural components of urban forests;

- Applying mapping methods when collecting and presenting information;

- Developing electronic applications for demonstrating and processing information on urban forests;

- Ensuring multi-level collection and processing of information: at the regional and local levels, and at the level of a separate forest, with subsequent free access to it;

- Issuing an annual report on urban forests and urban forestry, in which the dynamics of changes can be traced;

3. Conducting scientific research on urban forests as natural objects and a component of urban space and economic system. Objectives:

- Ensuring an interdisciplinary approach to the study of urban forests and urban forestry;

- Scientific research is in tune with the current needs of society and environmental problems, and considers all existing problems in the context of economic interests as well;

- Development of urban forest development projects takes into account current social problems of post-war reconstruction and contributes to their solution;

- Accessibility of scientific information.

4. Adaptive management of urban forests. Objectives:

- Application of interdisciplinary planning to cover all relevant interests in the field of urban forests;

- Consideration of risks to urban forests that may arise in the near and long term, and development of an action plan to overcome them;

- Development of measures, types of landscaping and a list of promising plants for the creation of urban forests in coastal areas in the arid south of Ukraine;

- Involvement of citizens in the management of urban forests.

5. Formation of specialists in the field of urban forests. Objectives:

- Launching educational programs in higher educational institutions in the field of urban forestry at the faculties and departments of forestry;

- Ensuring further professional development of specialists through the launch of certified advanced training courses;

- Signing agreements on joint training with countries with experience in urban forestry, for

example: Canada (Canadian Urban Forest Strategy), USA (U.S. Department of Agriculture), Sweden (Forest Agency), etc.;

- Promoting the participation of employees in professional conferences, for example - the Canadian Urban Forest Conference, and creating a similar event in Ukraine;

- Developing and implementing professional standards for urban forestry on a nationwide basis.

Conclusions and perspectives of further research.

Based on the analysis of foreign experience in the development of urban forests, it can be said that this area is considered together with such problems as: population well-being, adaptation to climate change, population involvement in the development of urban forests and accessibility to ecosystem services. Therefore, focusing on Western experience, it can be said that developing the urban forest industry separately from social problems does not make sense. Therefore, the development of urban forests should be oriented towards the real needs of society and existing environmental problems. Therefore, to create effective strategies for the development of urban forests, it can be proposed to establish basic indicators of the main characteristics of urban forests in comparison and relationship with other social and environmental indicators of urban space, in order to implement the following organizational and economic measures regarding the development of urban forests:

1. Formation of policies and goals in accordance with social and environmental data of urban space: indicator of tree cover in percent; indicators of air pollution and heat islands; demographic indicators (gender, age, life expectancy, profession, nationality); medical information with consent (allergic diseases, oncological, autoimmune, cardiovascular, neurological, psychological state); recreational capacity and recreational load on green spaces for public use;

2. Establishment of effective land use and development of planning: type of land use (permanent or temporary); form of ownership; intended purpose; environmental protection status of territories; economic specialization of adjacent territories;

3. Assessment and monitoring: number of green spaces individually and in percentage, tree species, age of trees, pest infestation; bird populations living in the territory of the urban forest (species, nesting sites and food base);

4. Improvement of the regulatory framework for the development and operation of urban forests: data on permits for the use of territories and types of use; monetary valuation of lands; existing restrictions on land use; cases of violation of restrictions on the use of urban forest lands;

5. Increasing the economic attractiveness and significance of urban forests: economic specialization of adjacent territories; economic condition of urban forests as an object of municipal economy; share of land in private and municipal ownership; involvement of credit institutions and environmental funds in the stratification of urban forest territories; recreational capacity and recreational load.

We see the prospect of further research into the topic of urban forest development in the context of solving the problems of rehabilitation and improvement of the population of modern cities. Provided with a scientifically sound approach to the selection and combination of plants, green spaces have significant potential in creating therapeutic effects. This issue will be investigated in more detail in further works.

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