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INTRODUCTION

The publication summarizes a very dense range of research important for strengthening the national identity of each country in the study of the elements of the architectonic landscape synthesis. One of the studies underlines that the opinions of Latvian state institutions are related to the understanding of the values of cultural heritage, its accessibility, conservation of historical landscape areas, assessment of the landscape protection zone, non-obscuring or releasing of viewlines (silhouettes, panoramas), etc. These are the issues that are poorly reflected n Latvian municipal documents. They are mostly dominated by decisions and refer to practical or business-friendly activities. Along with the increased attraction of EU investment in agriculture, the above-mentioned issues become even more aggravated – at which expense the cropland areas and the respective payments are increasing? Is it really done at the expense of the landscape?

Proceeding with the above finding, it is clear that the process of planning and management of Latvian landscapes of national significance is achievable with the overarching goal of preserving the values of each landscape, setting the quality criteria and developing the tools of landscape planning and management, respecting the principles of engagement and promoting the understanding of landscape, as well as ensuring regular landscape monitoring.

The same overarching goal has been also set by the researchers of Ukrainian landscape, carefully analysing the interaction between architecture and the natural environment in the context of national identity. The researches have analysed the means of expression of national character, mentioning such example as recognition of the values of open-air and ethnographic museums and the fragmentary use of folk tradition motifs in modern parks.

The expression of the national character of Ukrainian landscape is strengthened also by the streamway of Dnipro river and terrain near Kyiv. Undoubtedly the problems of modern urban load also affect the landscape of Kyiv.

The findings of Ukrainian spatial planners have been based on minimal interference with the natural environment and its maximum use in improving the architectonic expressiveness of buildings. The aim of the study is to identify the traditional and innovative elements in the modern landscape of Ukrainian Orthodox churches. The research of the Ukrainian landscape in the 17th-18th centuries is being determined.

This applies to the economic problems of urban and rural population, the ecological and emotional psychological burden caused by a polluted environment.

PRIEKŠVĀRDS

Izdevums apkopo ļoti blīvu pētījumu spektru, kas ir svarīgi katras valsts nacionālās identitātes stiprināšanai arhitektoniskās ainavtelpas sintēzes elementu izpētē. Viens no pētījumiem akcentē, ka Latvijas valsts institūciju atzinumi ir saistāmi ar Kultūrainavas mantojuma vērtību sapratni, pieejamību, vēsturisko ainavtelpu konservāciju, ainavas aizsargjoslas ievērtēšanu, skatu līniju (siluetu, panorāmu) neaizklāšanu vai atbrīvošanu u. c. Tie ir jautājumi, kuri ir par maz atspoguļoti Latvijas pašvaldību dokumentos. Tajos vairāk dominē lēmumi un virzība uz praktisko vai uzņēmējdarbību veicinošu darbību. Pieaugot ES investīciju piesaistes kāpinājumam lauksaimniecībā, saasinās iepriekš minētais – uz kāda rēķina pieaug aramzemju platības un to maksājumi? Vai patiesi uz ainavzemju rēķina?

Turpinot minēto atziņu, ir skaidrs, ka Latvijas nacionālas nozīmes ainavu plānošanas un pārvaldības process realizējams ar virsmērķi – saglabāt katras ainavas vērtības, izvirzot kvalitātes kritērijus un izstrādājot ainavas plānošanas un pārvaldības instrumentus, respektējot līdzdalības principus un veicinot ainavas izpratni, kā arī nodrošinot regulāru ainavu monitoringu.

Šādu virsuzdevumu ir izvirzījuši arī Ukrainas ainavtelpas pētnieki, rūpīgi analizējot arhitektūras un dabas vides mijiedarbību nacionālās identitātes kontekstā. Pētnieki ir analizējuši nacionālā kolorīta izteiksmes līdzekļus, kā piemērus minot brīvdabas un etnogrāfisko muzeju vērtību apzināšanu un tautas tradīciju motīvu fragmentāru izmantošanu mūsdienu parkos.

Ukrainas ainavas kolorīta izteiksmi spēcina arī Dņepras upes tecējums un reljefs pie Kijevas. Nenoliedzami, mūsdienu urbānās slodzes problemātika ietekmē arī Kijevas ainavu.

Ukrainas teritoriālplānotāju atzinumi ir balstījušies uz minimālu iejaukšanos dabiskajā vidē un tās maksimālu izmantošanu ēku arhitektoniskā izteiksmīguma uzlabošanā. Pētījuma mērķis ir identificēt tradicionālos un inovatīvos elementus mūsdienu Ukrainas pareizticīgo baznīcu ainavā. Tiek noteikta Ukrainas ainavtelpas izpēte XVII–XVIII gadsimtā.

Minētais ir attiecināms uz pilsētu un lauku iedzīvotāju ekonomiskām problēmām, ekoloģiski un emocionāli psiholoģisko slodzi, ko rada piesārņota vide. Spilgti ir raksturots Černivcu reģions Ukrainā.

Vēl viens no pētījumiem veido spēcīgu sazobi ar iepriekš minēto. Kaut arī pastāv Eiropas valstu reģionu atšķirība, bet vienota paliek sapratne par būvkonstrukciju ekoloģisko izpildījumu un videi draudzīgu dizainu augstā estētiskajā kvalitātē.

A vivid description of the Chernivtsi region of Ukraine is provided.

One more study makes a strong connection to the above. Although there are differences among the regions of European countries, there is still a common understanding of the ecological performance of building structures and environmentally friendly design at a high aesthetic quality level. The aesthetic expression among scientists is also called the sustainable aesthetics.

The second trend of researches summarized in the magazine is related to the search for the development of the stylistics of modern parks with the ability to achieve high level of uniqueness, where the expression of three types of parks is synthesized - the expression of Italian gardens, French regular parks and English landscape parks. One of the studies looks at the historical horticultural traditions of China and Japan in both countries. As a result, the study shows that the traditions are based on religious syncretism with regional features. Over time, the Chinese and Japanese gardens became more different from each other. The Chinese garden continued to improve its hedonistic orientation, while the Japanese garden opted for the maximum asceticism, the aesthetics of empty space. A similar study describes a comparative analysis of historic and modern gardens and parks, which is being conducted to show which elements of traditional oriental landscape design are quoted the most.

The language of modern architecture formation becomes more and more confluent with the elements of the greenfield site. The same applies to the open-air stage in Roja, Latvia. The characteristic features of the seaside landscape can also be noticed in the dendrological assortment: pines, Vacciniosa, red heather, gold leaves in autumn. A landscape that serves as a mean of harmonisation in the interaction of the outdoor and indoor space through architecture. Without doubt, solving and researching issues related to digital parametric modelling in architecture with CAD-CAM paradigm approaches, as well as evaluated digital skills and approaches during COVID-19 in landscape architecture.

Estētiskā izpausme zinātnieku vidū tiek saukta arī par ilgtspējības estētiku.

Otrs žurnālā apkopoto pētījumu virziens ir saistīts ar parku stilistikas attīstības meklējumiem mūsdienās, ar spēju sasniegt augstu unikalitāti, kur vienkopus ir sintezēta trīs veidu parku izteiksme – itāļu dārzu, franču parasto parku un Anglijas ainavu parku ekspresija. Viens no pētījumiem aplūko Ķīnas un Japānas vēsturiskās dārzkopības tradīcijas abās valstīs. Rezultātā tiek pierādīts, ka pamatā bijis reliģiskais sinkrētisms ar reģionālām iezīmēm. Ķīniešu un japāņu dārzi laika gaitā attālinājās viens no otra. Ķīniešu dārzs turpināja uzlabot savu hedonistisko orientāciju, savukārt japāņu dārzs sekoja maksimālas askētisma, tukšas telpas estētikas ceļam. Līdzīgs pētījums vēsta, ka tiek veikta vēsturisko dārzu un mūsdienu dārzu un parku salīdzinošā analīze, lai pierādītu, kuri tradicionālā austrumu ainavu dizaina elementi tiek citēti visvairāk.

Mūsdienu modernās arhitektūras formveides valoda aizvien pārliecinošāk saplūst ar dabas pamatnes elementiem. Tas ir attiecināms arī uz brīvdabas estrādi Rojā, Latvijā. Piejūras ainavai raksturīgais ir nolasāms arī dendroloģiskajā sortimentā: priedes, mētrājs, viršu sārtums, lapu koku zelts rudenī. Ainavtelpa, kas kalpo kā harmonijas līdzeklis ārtelpas un iekštelpas mijiedarbē caur arhitektūru. Viennozīmīgi risinot un pētot jautājumus, kas skar digitāli parametriskās modelēšanas jautājumus arhitektūrā ar CAD-CAM paradigmu pieejām, kā arī vērtētas digitālas prasmes un pieejas COVID-19 laikā ainavu arhitektūras jomā.

Aija Ziemeļniece
Editor in Chief

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Spatial identity of Latvian cultural landscape within regional context

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Abstract. The value of the cultural landscape heritage, its accessibility, preservation, landscape protection zone rating, avoidance of blocking or releasing viewlines (silhouettes, panoramas) etc. – these are the issues which are very little reflected in municipal documents.

The documents mainly consist of decisions and support to meet practical or business-friendly needs. Along with the increased attraction of EU investment in agriculture, the mentioned issues become even more aggravated – at which expense the areas and the respective payments are increasing? The answer is one – at the expense of the landscape.

In each of Latvian counties, there are territories that cannot lose historical value and we must search for a mutually beneficial algorithm.

EU funding projects must contribute to the preservation of the cultural landscape heritage, i.e. to the introduction of Europe's best philosophy and practices. The recovery of the cultural landscape, including maintenance works and its progress in postsocialist areas, is not an easy task, knowing the existing ownership and the economic situation in the country. Will we really get a greater contribution to the state economy from the amount of threshed centners than from the preservation of landscape values in the long term?

A task of crucial importance is the research of each region's landscape space, the development of a concept and elaboration of project documentation. As the study shows, Latvian greenfields and cultural heritage calls for the actions to form several areas of the museum reserve.

Keywords: cultural-historical landscape space, compositional axes, functionality, harmony, visual psycho-emotional highlight in landscape

Introduction

Cultural-historical heritage is a cultural landscape that forms a part of the human life quality and characterises the level of public intelligence in general.

This is more relevant to the present moment, as the beginning of 21st century is characterised by the manners of the consumer society. The prevailing values are the property values of society rather than the ability to assess the life space, the cultural landscape, the elements that form it and the context that creates an expression of the landscape space identity. This is attributable to each region of Latvia and its architectonical landscape values.

This is also defined in the Council of Europe Framework Convention on the Value of Cultural Heritage for Society, stating: "*...cultural heritage is a group of resources inherited from the past which people identify, independently of ownership, as a reflection and expression of their constantly evolving values, beliefs, knowledge and traditions. It includes all aspects of the environment resulting from the interaction between people and places through time."*

Thus, cultural landscape as a historical heritage is formed by a greenfield and objects created as a result of human activity at different times. They are visually and functionally linked and must be harmonised in the environment.

Already in 17th, 18th century, a unique building of a cultural space was created by human labour in the territory of Latvia, which was closely complied with a greenfield features – terrain, waterside, climate, floodplains, forest compartments, viewlines in the landscape.

By increasing the visual aesthetic of the building volume, it was based on the balance of architecture and nature context.

At the end of 19th/beginning of 20th century in Latvia, due to wars and the turmoil and variability of the state political system, the economic stability and values get lost, fragmentation is developed, targeting against the preservation of the cultural space by creating disbalance. This applies to the scale, protection zones and visual aesthetic quality in the spatial structure in general. The hardest hit on cultural landscape of Latvia was made by the political turbulence of 50s-80s of the 20th century.

On the other hand, the year 2021, on the contrary, convincingly brings the landscape into the Latvian cultural canon. Along with the most distinguished values of such fields as popular traditions, architecture and design, stage art, literature, visual arts, music and cinema, eight canonical landscapes of Latvia – the landscape of Daugava, the landscape of Zemgale plain, the landscape of Gauja, the landscape of Latgale, the landscape of Latvian forests, the seaside landscape, the landscape of Vidzeme hilly areas and the landscape of Abava old valley.

The context of the spatial identity of the cultural landscape consists of forest landscapes, watersides,

agrarian landscape scale, sacral landscape, manor ensembles landscape, urban roof landscape. Architectonical spatial forms in the rural landscape are subordinated to nature elements as a single ensemble. For example, the shape of Vidzeme's rooftops imitates picturesque hills; the nature of Zemgale's wind loads can be found in the industrial dominants of windmills; the seaside fishing villages represent the seashores with fishing net sheds, boat steaks, the Latgale's architectonical landscape identity highlights the half-shaped wooden buildings with several yards nestling along a lake shore or a pasture ground road.

Cultural heritage is a group of resources inherited from the past which people identify, independently of ownership, as a reflection and expression of their constantly evolving values, beliefs, knowledge and traditions. It includes all aspects of the environment resulting from the interaction between people and places through time (*from the Council of Europe Framework Convention on the Value of Cultural Heritage for Society, 27.10.2005.).*

Research goal – to evaluate the transformation processes of the cultural and historical landscape influenced by economic and political situation.

Research objectives

- to examine the factors contributing to changes in spatial identity;
- to define the conditions for the development of the transformation processes in visual-aesthetic qualities of the historical cultural landscape both in rural landscape and urban areas;
- to evaluate the landscape as one of the art branch, which creates the synthesis of a greenfield and architectonical artistic values.

The relevance of the research is based on the insights of the recovery of cultural and historical landscape identity in the regions of Latvia.

One of topical issues of the research is the evaluations of the activity carried out by the National Cultural Heritage Administration of Latvia in 2020, emphasizing: *to develop a society-friendly and professional cultural heritage protection system which, in line with internationally recognised principles, helps owners and users of cultural monuments to preserve values in good quality and prevents activities degrading cultural and historical value, ensuring that the values of the cultural and historical environment of Latvia are a part of a high-quality living area which is understood, evaluated and protected by the local community, which helps to create sustainable growth. The increase of the role of cultural heritage as a substantial part of the human life quality and its creation. Preservation of cultural heritage for future generations. Use of cultural heritage as an economic resource for the economic development of the country. Creating the image of Latvia with the help of cultural heritage [NKMP (State Inspection for Heritage Protection) 2020 activity report]*.

Materials and Methods

The Florence Declaration on Heritage and Landscape as Human Values (2014) makes it clear that *"... it is time to challenge the artificial distinction between conservation and innovation*".

In Latvia, so-called *cultural corridors* can highlight the values of historical research and cultural significance by restoring traditional paths. One of them is the *Northern String (Ziemeļu stīga)* – the territory of common interests in the Latvian-Estonian border area.

The second one – *the Jacob's Road (Jēkaba ceļš)* – the reign of Jakob Kettler, Duke of Duke of Courland and Semigallia.

Nowadays, the biggest challenge for the cultural space or cultural landscape is to ensure the Florence Declaration's requirement that "*... the application of technologies to cultural heritage responds to well-defined key objectives, avoiding the risk of only making progress in the technological sector without improving conservation practice*"[2].

A landscape space is a place where the picturesque nature of greenfield and the compositional spatial elements meet together through rhythm, dynamics, form and colour in the seasons of a year.

American sociologist Toffler states: *acceleration of the pace of change acts as a psychological factor that radically changes the perception of our lives and the surrounding space, destroying the balance of the human soul. External acceleration transforms into internal one. In order to survive, people must become much more plastic and suitable, much more flexible than before. We must constantly look for new ways of stabilizing life* [11].

The development of the acceleration in society affects the **cultural environment**, which must be brought along without losing historical harmony, scale and balance.

The Latvian landscape is distinctly marked by three periods:

- 20s-30s of the 20th century, following the agrarian land reform, when the ideology of nationalism gained new boost in Latvia. That means – from the Baltic German cultural space to the Latvian landscape space. The landscape space and architectural monuments became **cultural symbols in political terms** [11]. The visual and functional harmony of the cultural space began to reflect the political ideology of the state. It influences the change of the cultural and historical landscape space heritage;

- 50s-80s of the 20th century. The decrease in visual expression of Latvian landscape space and the formation of a so-called irreversible transformation processes (high-capacity HPPs, continuous amelioration, dismantling of farmsteads, creation of large-scale cropland territories; promotion of overgrowth of churches and manor ensembles);
- beginning of the 21st century – a trend of rapid economic pulsation in the Western Europe.

The uniqueness of Latvian nature in all its regions maintains a high level of ecological quality. The same high position can be attributed to the visually-aesthetic quality of the landscape space.

Thinking about modern concept of time and space and its understanding problems, the level of time abstraction is incomparably wider. The above-mentioned elements of the cultural space development have been accumulated over time [11].

The level of political and economic development – the Middle Ages, abolition of serfdom, redemption of land, devastating wars, occupation of power, struggles for freedom, development of the international level – all these pulsates within cross-section of time, too. Nowadays the creation of any spatial environment is linked with the time factor supplemented by the political situation, which undoubtedly gives rise to the processes of landscape transformation.

The **regional character of the landscape** is formed by the historical influence of different styles, which has arisen from the **landscape-spatial influence** of urban and rural settlements, which has assimilated local traditions in the process of forming [9].

The landscape exists as a source of inspiration for the preservation of regional design principles, where the **synthesis of the greenfield, architecture and urban planning space is created.**

The landscape context is the most basic, the easiest for comprehension type of context, the understanding and respect of which is a prerequisite for the maintenance of the regional landscape.

Architect, Professor Ivars Strautmanis writes: *today, the concept of landscape context cannot be considered in isolation from the effects of human activity. Cultural landscape is a concept that is synthesized under the influence of nature, construction and economic activities, as well as art and culture. The landscape context is a complex concept that includes the cultural landscape developed in a given region over a century with aesthetic quality of different degrees of construction* [12].

The surrounding spatial environment can affect the spiritual level of society.

Our ancestors, living very close to nature, were able to look at the environment with great attention and read all information necessary for their existence, which helped them in hunting, forecasting weather etc. By losing contact with nature, we have not lost the ability to react sensitively enough to our immediate surroundings. Speaking about the ability of people to percept the surrounding environment, it must be emphasized that physical perception cannot be separated from physical perception. The perception of space is influenced by the total memory accumulations, the level of human culture and the mental structure. It means that the emotional and aesthetic evaluation of the information perceived depends, to some extent, on the level of social and intellectual development of a person. The amount of aesthetic information depends on the OPPORTUNITY to perceive and feel the landscape in a greater or lesser degree.

The art of creating space is the highest degree of human activity [10]. In terms of meaning, the most important information is provided by the silhouette or shapes of the spatial ensemble, as well as by its plastic structure.

The elements of any spatial environment and their overall image in the silhouette represents the most visually saturated and emotionally active information.

The landscape designer must assess the objectivity of society's development forecasts and have a good knowledge of sociology. In the creation of new spatial structures, he must be able to use the consistent patterns of society development. As practice shows, it is not so easy to go into details of public life.

Sociological surveys reflect information about past, about the developments in the spatial structure that already exist. Therefore, for the sociological forecasts to be realistic, they need to be made in a far-sighted manner and with a sound vision for development. This equally applies to both the rural landscape and the development of urban infrastructure [12].

In recent years, along with intensified environmental protection, we hear with increasing frequency that it is not allowed to build rural villages in areas with significant landscape quality. Therefore, there are many places where new buildings are developing in a less landscape-expressive environment.

On the contrary, new building can and should be designed in the areas with the smallest possible landscape significance. Of course, by maintaining tolerance as to the main viewlines, overall silhouette, trees, historic alleys, terrain, water basins etc.

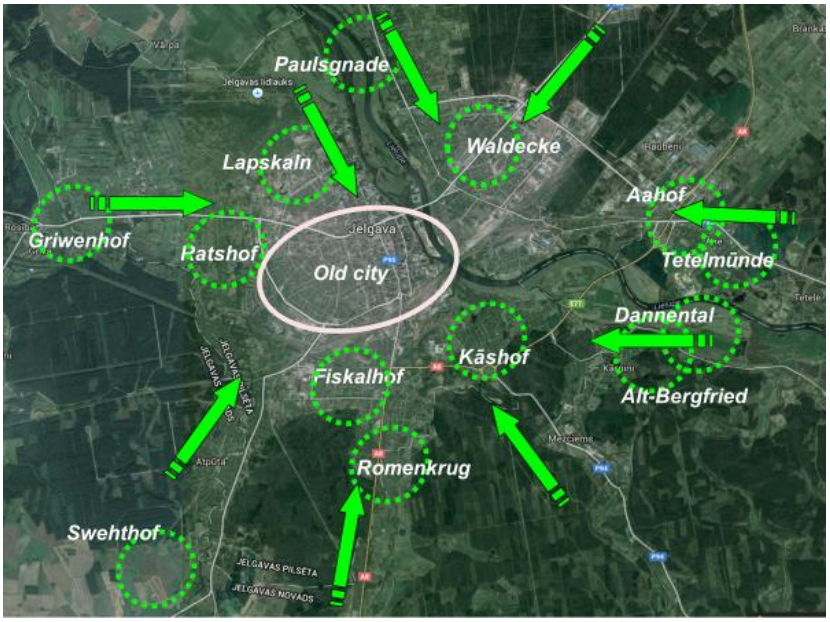

Fig. 1. Along with the progress of the urban load, the rural cultural landscape around the urban space transforms. Jelgava / Mitau and its surrounding manors at the end of the 19th century [authors' diagram]

When the local landscape becomes a part of a new spatial structure and the buildings become more attractive in terms of local identity, the attitude of the society changes as well, forming a harmonious dialogue with the living space [12].

Creating a living space, public space, architectural forms of buildings and functionality workload (agricultural load, industrial load, etc.) at an aesthetically high level, we create **a continuation of the cultural environment, which brings along the identity of a landscape space**. The architectonical spatial shaping, which is different for each region of Latvia, plays a certain role in the recovery of the mentioned context. The regional identity of the 21st century tries to create a synthesis of cultural, historical and modern aspects. Without understanding of the language and peculiarities of local and regional architecture, it is not possible to create contemporary architectural trends and their harmony in the modern landscape space.

The Latvian cultural landscape is characterized by the LATVIAN SPACE. At the beginning of the 21st century, it must be open to time and changes in social life, yet not losing the experience gained by the people over the centuries.

It may be necessary to develop a new concept: SYNTEGRITY = Synthesis + Integrity = creation of a new spatial quality, combining both local and global practices and spatial design techniques tested in social life, integrating them into a material spatial and landscape context [11].

The proposed line in the perception and development of the local spatial landscape context is by no means simple. Syntegrity not only requires respect and sensitive attitude towards local traditions, but also a creative spirit and courage to look at traditions with a modern innovative approach. The modern Latvian space is a product of syntegrity, which includes the heritage of achievements of the people's spiritual and material life over the centuries, respecting the perception of modern people, as well as their dreams and visions about living space [13].

A bright illustration of this is the second half of the 20th century. The prevailing tendentious nature of politics has almost completely eliminated the double-pitch roofs, which vividly characterize the regional peculiarities of the Latvian rural landscape, climatic conditions and construction traditions - clay tiles, lime plaster, chalk whitewash.

The 21st century enters Latvian regions by restoring historical cultural landscape, and we can already see the first results. For example, the bends of the Daugava river near Kraslava – the steep bank has been cleaned from the overgrowth of seed plants, and a small section regained its viewlines on water and the coastal slope.

On the other hand, the structure of the new building - its density, height of buildings, architectural form, colour, green areas, pole and wicker fences reflect the search for the seaside landscape of Pavilosta and its historical expression. The landscape space of the new village represents vivid reflections of the compositional nature of the former fishermen's farmsteads and the interplay of the greenfield site identity. One more example.

Huge industrial steps of the 19th/20th century in Jelgava, the former capital of the Courland Governorate, have brought the processes of transformation of the historic urban space. Until the middle of the 19th century, there was a dense network of rural manors around the city [Fig. 1], creating a rural road infrastructure and a peculiar

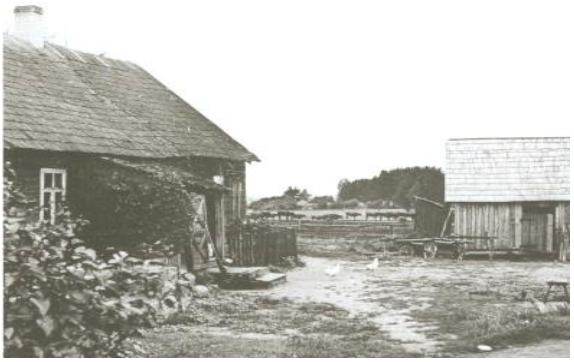

Fig. 2. Farmstead "Pļavu Vonogi" in Liksna parish, Daugavpils county [15]. The landscape foreground, middle ground, background - the clumps of lilacs, the yard, pastures

Fig. 3. The language of regional features in the urban space. Roof landscape [11]

green cultural and historical ring with parks. During the period of the rapid expansion of the city in the post-war years and in the middle of the 20th century, the ring of heritage has been destroyed and replaced by multi-storey residential districts, production and storage areas, etc., thus creating a so-called urban ring. The nature of regional identity in the urban space disappeared.

Results and Discussion

One of the most important preconditions for the realization of the processes of synthesis is the creation of a common spatially harmonious concept with the aim of creating an emotionally saturated landscape space ensuring visually aesthetic and functional quality. It allows for increasing the level of spirituality in a given region, highlighting the national identity and the traditions of the place [13].

Economic and political situation and transformation processes in the 50s-70s of the 20th century provoked spiritual degradation and loss of self-worth of the nation; while the low infrastructure threshold in the 90s of the 20th century contributed to the outflow of the Latvians from the countryside to the cities, where they could find work for themselves and schools for their children.

Fig. 4. The search for a synthesis of historical spatial identity and modern stylistics in the urban landscape, 2019.
[the authors' photo archive]

Fig. 5. Return of the wooden heritage in Pavilosta. Shape, colour, proportion, gardens, 2019 [the authors' photo archive]

As a result, the concerns about the maintenance of natural scenery, local traditions and local identity changed. The above aspects are inseparable from one another, because the landscape **creates a comprehensive synthesis process** between the new and the old, the traditional and the contemporary, between nature and man. It is expressed in the above-mentioned need for **contextual thinking and searching on the landscape** in order not to diminish the visual aesthetic quality, which is the case, for example, with the ancient valley of Abava river between Kandava and Sabile, where bushes are covering long picturesque viewlines across the valley.

To obtain a good quality attribute in creation of spatial environment, the professional training of the cooperation partners is no less important. It is not just a matter of acquiring the traditional skills of one's profession, but of balancing spatial sense of interdisciplinary professionals, which is mandatory for anyone who wants to cooperate in the design a spatial environment and its elements. It sets the requirements related to the peculiarities of spatial structure and its compositional aspects, means of

artistic expression and transformation processes in the landscape space. Personal experience gained in cooperation with specialists in various fields in solving tasks related to specific forms of the spatial environment, as well as the ability of creative interpretation of the means of expression in accordance with the scale and nature of a given landscape space is of vital importance. The nature of the spatial identity of the region in the circumstances of a pluralistic cultural space requires mutual understanding and a certain degree of compromise from all cooperation partners. However, it is not enough for a good specialist who understands and knows the landscape. He or she must be able to think in a specific landscape context [11].

This is based on the design work, which, first of all, is developed during detailed planning performed by interdisciplinary specialists, creating an argumentative basis for the landscape vision. Unfortunately, a well-started planning work is not moving forward because the legislation requires a new procurement to be organized. New participants or specialists enter the project, bringing new ideas. Municipality members change and the plans that have been previously set collapse. Thus, at the administrative strategic level, the cycle of continuity in the progress of planning is broken.

At the beginning of the 21st century, as the pace of life and the travelling speed increased accordingly, the perceptions of movement dominate in the everyday life, providing more and more information in a shorter period of time. This increases the viewer's / citizen's demand for harmony, scale and spatial proportionality more and more.

In the perception of the landscape space, there is a problem related to the language of spatial design, its comprehensibility and visual aesthetic quality.

The nature of regional identity can also be read in the **urban or town planning landscape.** The height, density and stylistics of historical buildings are different in Varaklani, Cesis, Jekabpils and Aizpute. This equally applies to roof slopes, roof coverings, exterior wall materials and colour.

The restoration of the Republic of Latvian at the end of the 20th century gave rise to a new situation in the protection of cultural heritage in order to continue the commenced work, which was discontinued in the 40s of the 20th century, by joining the cultural heritage protection convention (the UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage, the Convention for the Protection of the Architectural Heritage of Europe, etc.), as well as promoted the restoration of private property rights. The new acquisitions also brought new challenges, for which there was no previous experience.

We had to keep in mind that the activity of cultural institutions will be affected by the same conditions as the developed countries of Europe come across – the tendencies of cultural globalization, fluctuations in the economic environment, the level of development of tourism infrastructure, engineering communications etc. At the end of the 20th century, the above-mentioned problems became even more acute for rural areas. Country churches, country manor complexes with a park, access ways. In addition, the construction of old manors in the post-war years was subordinated to the needs of collectivization, creating farm premises, mechanical workshops, grain storages, silage pits, treatment facilities in the park. The historical silhouette of a manor was most often covered with grain towers, cattle farms, etc., thus degrading the cultural and historical landscape both visually and functionally.

The year 1991, which rapidly brought a change in the political situation in the country, failed to restore the cultural environment in the rural landscape. Everything happened fast, including the privatization process. In the 1960s-1980s, in the rural landscape, large-scale agricultural and industrial production building increased, obscuring the silhouette of historical buildings. The scale of the rural landscape has changed.

Half a century later, in the 20s of the 20th century, serious wood overgrowth has developed. Most often, the tree cover affects cultural and historical sites rather than large-scale production areas. This is especially true for the visual loss of viewlines in the geomorphologically pronounced areas.

Sacral landscape

The highest manifestations of the interaction between the expression of the greenfield site and the formation of architecture, which are maximally approaching the level of synthesis, are usually associated with various social rituals of spatial environment, the emotional tension of which approaches the level of peculiar catharsis.

Church can be mentioned as a classically strong element in the rural landscape, which starts the emotional uplift with a visual bell tower dominant in the distant viewlines. Further emotional uplift is continued by closer viewlines of the sacral landscape, where the architecturally decorative elements can be read. The next impressions are the interior with lighting, paintings or sculptures, the means of musical expression and the message to the churchgoers. On the other hand, when leaving the church, the emotional uplift is formed by the expression of the distant viewlines of the rural landscape, which create synthesis with the content of the church ritual. The perception of this emotional uplift of the sacral landscape, where different elements of the landscape, scales and view angles are concentrated, develops differently for each region, which is reinforced by the characteristic greenfield site [12].

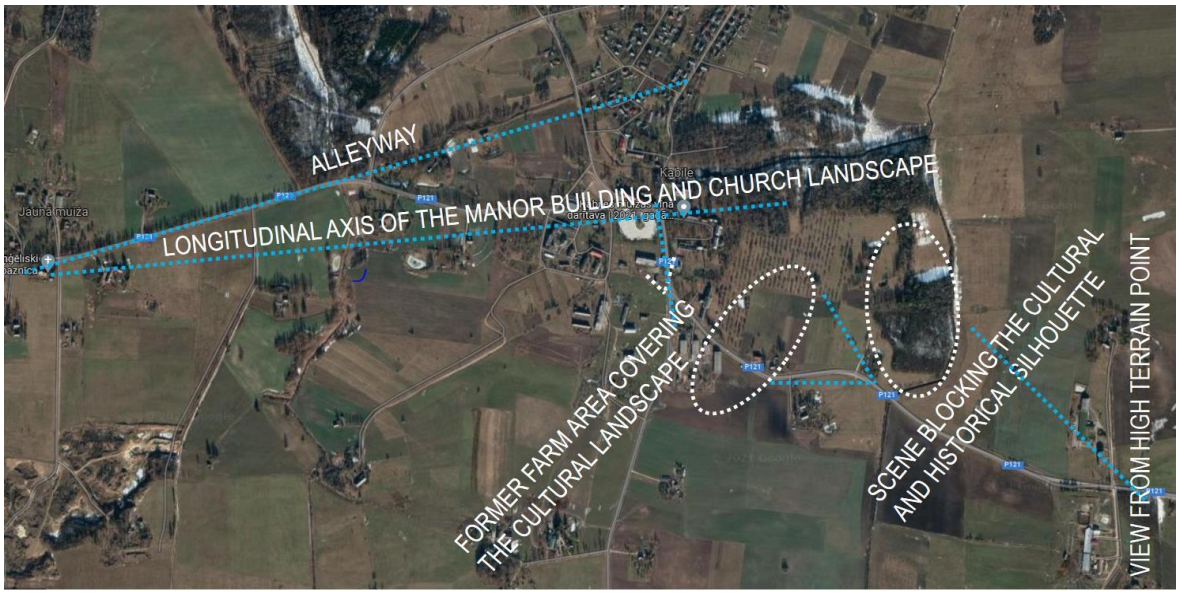

Fig. 6. Lost viewlines in the perception of the cultural and historical landscape. Dominance of agrarian landscape. Kabile Manor ensemble, 2021 [the authors' diagram]

Fig. 7. The overgrown trees obscure the elegance of the church. Kabile church, 2021 [the authors' photo]

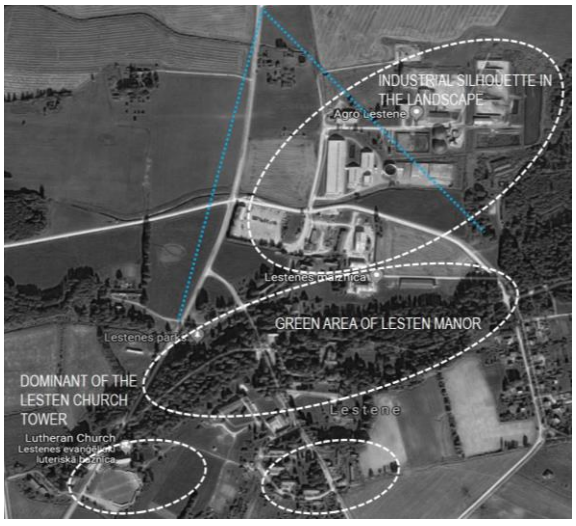

Fig. 8. The manor's ensemble, the church, memorial, industrial production area, residential area. Lestene. The search for the culmination elements in the landscape space, 2018 [the authors' diagram]

This level of comprehensive synthesis in the landscape space and visually compositional balance must be created in both urban and rural landscapes. The synthesis of different scales, line lengths, colours and shapes is mentioned above – the search for SYNTEGRITY in the rural landscape, where the main task is to ensure the functional and emotionally aesthetically harmonious interaction of all its elements. The emotional aesthetic unity of the spatial environment does not arise by itself as a logical result of the functional and technological complex of all elements of the landscape space. It requires a purposeful action and a certain programmatic orientation that would reflect all the society's demands for a full-fledged environment which stimulates for development.

A number of examples must be mentioned. For example, rural churches – Evangelical Lutheran churches of Kabile, Mezotne, Sesava, Salgale, Vircava, etc. include a huge scale of agrarian landscape. However, the volumes of churches are hidden in the branches of large trees.

The spatial landscape concept is characterized by three main criteria:

- the most important functional areas in the landscape space, directions of movement and possibilities of landscape perception;
- groups of relevant premises and their nature;
- level of the landscape's emotional aesthetic saturation.

The spatial composition is mainly based on the contrasting coordination of individual elements. In addition to the above said, LATVIAN SPACE can be formed if regional peculiarities in the greenfield site are purposefully synthesized and rooted in the traditional forms and structure language (construction, architecture, art) [13].

When the visual and functional balance of the sacral landscape is lost, it loses its aesthetic quality. There is a number of such examples, especially in the areas of fertile cropland territories, dominated by the agricultural and industrial load over the cultural landscape (Lestene, the historical centre of Lielvircava, etc.). The trees planted in the beginning of the 19th century around the country churches were the symbol of holiness. Today, the trees are 200 years old and exceed the height of the church.

For example, the sacral landscape of Kabile church, which has lost three main expression means: the size of the church, the size of the vicarial manor and the expression of the tree alley.

Farm

The major part of the *Latvian space* will be associated with a traditional farmstead and a mosaic-type scale around it - an apple garden, a sauna with a pond, a flower garden with a pale fencing and a sweep well. During the post-war period, in the 60s-80s of the 20th century, the political situation suppressed the expression of the *Latvian spac*e and the nature of the identity of the regional landscape.

At the end of the 20th century in Latvia, after the liquidation of the Soviet system and the restoration of independence, the traditions of living and building in the countryside were gradually returning.

It is not possible to restore the historical scale and structure characteristic for Latvian countryside.

Funding is being attracted that is subordinate to the economic pulsation of the European Union, which brings a different scale and management methodology.

Considering the traditional sense of the environment and scale typical for the Latvians, ... Doctor of Arts I. Lancmanis states: *the core of the Latvian people lives in the countryside; therefore, I am afraid of the current process of rural depopulation, the closure of small schools. Unfortunately, the Soviet occupation regime destroyed normal agriculture by imposing a collective farm system. If our country had not been occupied, the Latvian countryside could have developed naturally, and farmers would have cooperated and formed cooperatives. However, the blow was too severe and now we see the consequences ... Many village schools used to be located in the buildings of former manors and castles, and after the closure of the schools they are left with no life ... Yes, this is sad. But not so much because of buildings as because of the changing rural environment and human relationships. A village school has always been able to foster children's love for their land and work, respect for traditions. When schools are merged and children have to move to another environment, some part of it gets lost inevitably ... It is obvious that there are no more chances to restore Latvia as it was in 1940, the Soviet regime destroyed it and crippled the Latvian soul. This regime did*

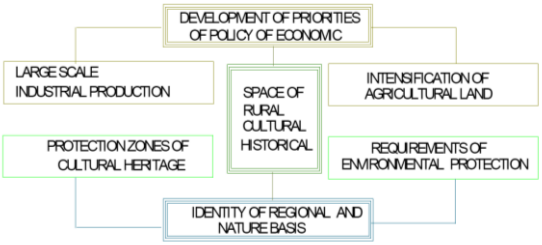

Fig. 9. The search for the harmony between economic policy and regional identity [the authors' diagram]

Fig. 10. The search for the formation of the greenfield and architectural elements in landscape. Mazmezotne. The left steep bank of Lielupe river, 2018 [the authors' photo]

Fig. 11. Farmstead in Vabole parish, Daugavpils county, 2015 [15]

something that the Germans could not do in 700 years. The Germans oppressed us, but they could not burst into the soul of the Latvian.

A classical Latvian farmstead – a model of high degree environmental harmony created by nature and human hands. Unfortunately, in today's industrial construction conditions, this traditional link of local craftsmanship has disappeared. This inevitably leads to the loss of local originality, to impersonal, indifferent landscape.

The landscape context is the most basic, easiest type of context. Understanding and respecting the landscape context is a prerequisite for maintaining the regional landscape.

Architect, Professor Ivars Strautmanis states: *Today, the concept of landscape context cannot be considered in isolation from the effects of human activity. Cultural landscape is a concept that is synthesized under the influence of nature, construction and economic activities, as well as art and culture. The landscape context is a complex concept that includes the cultural landscape developed in a given region over a century with aesthetic quality of different degrees of construction* [11].

Latvian farmsteads created yards, backyard root crop and flower gardens, fruit tree plantations. Latvian rural areas have acquired a visually strong landscape composition.

Along with the amelioration rate, the agricultural load increased in the 1960s, reducing the historical ditches and shrub cover and acquiring new cropland areas. The mosaic scale of the regional landscape space and the identity of the place gradually extinguished.

The 21st century started with intensive EU funding for Latvian farmers, which has increased the agricultural load. The capabilities of huge heavy-duty machinery allow to free up space for farmlands, gardens are levelled and sown.

Cropland areas are also being increased on account of old manor parks, plowing the land up to the branches of old trees, also plucking the roots of the trees. The search for regional and national identity in the landscape space.Understanding and respecting the landscape context is the main condition of the regional landscape. A merit of the everyday spatial environment is its compliance with the sense and requirements of the contemporaries, or the realisation of applicability, comfort. Not always it is possible to determine precisely the level of quality and the time of becoming outdated, so it is necessary to take a so-called "test of time" into account.

The aesthetic soul of our nation is the basis and the only primary source of the Latvian style [architect, prof. Osvalds Tilmanis, 11].

Country manors

In the rural scenery of Latvia, the visual perception of most country manor buildings is disturbed by the giant trees, and the buildings are not visible in the distant viewlines.

The trees planted during the agrarian land reform in the 20s-30s of the 20th century in the middle of the honour courts of manor houses were chosen with the aim to obstruct the recognition of the Baltic German cultural space. Most often these are pyramid cedar trees, as well as oaks, lindens, etc., which symbolized the succession of the Latvian environment and clearly indicated the political affiliation of the country. A century has passed, and the post-war understanding of cultural values has increased the dramatics of the situation.

Fig. 12. Plain cropland, which replaced the historical mosaic-type landscape with clusters, ditches, shrubs. Zemgale plain near Bauska, 2020 [the authors' photo]

Fig. 13. Distant viewlines across the Lielupe river ancient valley to the park of Mezotne Palace, 2020 [the authors'photo]

Fig. 14. Rural road to Mezotne Palace On the left bank of Lielupe river, beginning of photo the 20th century [private archive]

With the formation of collectivization in Latvia in the 1950s, the urban load ring around the former country manor ensembles gave even heavier blow. Treatment facilities were built in parks, next to them – multi-storey residential buildings, which obscure the view of the heritage space, and so on.

The most dramatic scale represents the industrial areas – mechanical workshops, cattle farms, water towers, grain dryers, weighbridges, transformers, silage pits, etc. After privatization in the 90s of the 20th century, the infrastructure was not dismantled but modernized. For example, the deprived gates left from the kolkhoz times, which block the viewlines from the

Skede road to the historical buildings of Kabile Manor [Fig. 6].

The historical mosaic-type landscape has changed its scale over the last 100 years. While farmsteads disappear, extensive fields and pastures arise in the landscape. To prevent the wind load from causing erosion of the fertile land, protection zones or groups of tree plantations are created without considering the viewpoints in the cultural landscape.

An emotional and visual uplift, which was created by the alleys with honour courts as the culmination point as far back as 1950s, was deliberately obscured by tree plantations and by placing monumental sculptural works (Laidi Palace, Kazdanga Palace, Vecauce Manor, etc.).

The visual load of the urban ring around the old manor centres was increased by standard residential buildings erected in the 60s-70s of the 20th century.

... in the rural cultural landscape, the manor is something important – just like the church and the pub. It has historically dominated the landscape and created a very good balance between the green environment and the things that man has put in it. The heritage is very beautiful, but it does not really have a sense of spiritual heritage. It appeared in an interesting way already after the agrarian reform in 1920. Then, there were a number of Latvians who could live as lords, as young barons in a deprived manor of a bankrupted baron. There were only a few exceptions. Only Mrs. Benjamin's character was strong enough not to be afraid of being called a Latvian baroness, and she lived very elegantly in Valdeki Manor... Latvian cultural landscape – Baltic German, Baltic, Latvian. The majority of Latvian society was indifferent or even disliked the cultural and historical significance of the former manors [I. Lancmanis, Interview with V. Gailitis in 2014].

There are several positive examples of recovering distant viewlines at both banks of Lielupe: The Mezotne Church, the left bank valley of the Lielupe river with a group of linden trees opposite the architect Berlitz's Mezotne Palace park on the right bank of Lielupe. At the bottom of the castle mound, the water landscape has been restored – the old port of Zemgale.

A few kilometres upstream the Lielupe, the Jumpravmuiza grotto grows into trees and bushes by the picturesque dolomite steep bank of the Lielupe river opposite the Bornsminde Manor. This is a prominent territory of the manor's museum reserve, which is supplemented by Kaucminde, Rundale, Svitene, Berstele, Gravendale, Salgale, Stalgene manors.

Hidden in giant trees, the left steep bank of Svitene river near Jaunsvirlauka Manor, Abava ancient valley between Kandava and Sabile, the ancient valley of Tervete river between Tervete and the steeple of Zalenieki Church, the arches of the Daugava river below Kraslava – these are the viewpoints from the old castle. A few kilometres downstream, there is a very dense shrub cover, which has taken over both steep banks and forms a peculiar tunnel of trees and shrubs, without even giving a hint of the picturesque slope of the river banks. Huge branches have bent into the riverbed by strong wind gusts.

Conclusions

The attempts of small nations to preserve their cultural space are not easy. Politics, economics, urban, agricultural and industrial load, ability to preserve the scale, shape, place identity – these are the tasks that must be considered in the development of detailed plans for the territory of each Latvian region. Picturesque landscapes must not disappear.

The nature of spatial environment becomes more and more internationally chaotic. The transport load and its speed, modernization, road straightening, huge viaducts, traffic noise suppressing and non-transparent walls, protective animal barriers etc. In general, it reduces the perception of the silhouette of the cultural landscape. It applies to both rural and urban landscapes.

In nature, a landscape architect acts as a competent film director, a scenographer, creating an epoch-appropriate landscape space expression in terms of functionality and composition. This applies to the creative activity of architects in both the 18th and the 21st centuries. The scale, the compositional structure of the outdoor space or landscape design and the harmony of the form are the most important conditions for creating an aesthetically high cultural space able to exist convincingly in today's market conditions.

In everyday life, when landscape architects face the practical work of preserving cultural heritage, the weak points are visible:

Such concepts as the value of cultural heritage and its accessibility to the public, conservation, non-obscuring / freeing of viewllines, suppression / elimination of degraded viewlines, etc. is underestimated in municipal documentation. This needs to be promoted very intensively among rural entrepreneurs, looking for mechanisms to achieve a favourable result.

A balance needs to be found in meeting the business needs – it applies to the enlarging of cropland areas in the countryside, as the increase of EU investments on account of landscape is not a good idea. The territories that must not be transformed due to cultural landscape values must be defined in each region.

A mutually beneficial algorithm must be developed by including a part contributing to the restoration of the cultural space identity in the funding target.

EU funding projects must contribute to the preservation of the cultural landscape heritage, i.e. to the introduction of Europe's best philosophy and practices.

The restoration of the cultural landscape must be well-conceived, led by professional teams and accompanied by authorial supervision.

In order to reach a high-quality research result, the assessment of the landscape space, the development of the concept and the elaboration of the project documentation are crucial. It is necessary to create the museum reserve areas, which are already strongly showing its presence.

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Kopsavilkums. Kultūrainavas mantojuma vērtība, pieejamība, konservācija, ainavas aizsargjoslas ievērtēšana, skatu līniju (siluetu, panorāmu) neaizklāšana vai atbrīvošana u. c. – tie ir jautājumi, kuri maz atspoguļojas pašvaldību dokumentos. Vairāk dokumentos dominē lēmumi un atbalsts praktisko vai uzņēmējdarbību veicinošu vajadzību apmierināšanai. Pieaugot ES investīciju piesaistes kāpinājumam lauksaimniecībā, saasinās iepriekš minētais – uz kāda rēķina pieaug aramzemju platības un to maksājumi? Atbilde ir viena – uz ainavzemju rēķina.

Katrā Latvijas novadā ir teritorijas, kuras nedrīkst zaudēt vēsturisko vērtību dēļ, ir jāmeklē abpusēji izdevīgs algoritms. ES fondu projektiem ir jāveicina kultūrainavas mantojuma saglabāšana – Eiropas labākās filozofijas un prakses ieviešana. Kultūrainavas atgūšanas, arī uzturēšanas darbs un tā virzība postsociālisma teritorijās nav viegls, apzinoties pastāvošās īpašumtiesības un esošo valsts ekonomisko situāciju. Vai patiesi uz nokulto centneru daudzuma mēs iegūsim lielāku pienesumu valsts ekonomikā nekā uz ainavzemju vērtību saglabāšanu ilgtermiņā?

Izšķiroši svarīga ir katra reģiona ainavtelpu izpēte, koncepcijas izveide un projekta dokumentācijas izstrāde. Pētījums liecina, ka Latvijas dabas pamatne un kultūras mantojums rosina rīkoties, lai veidotos vairākas muzeju rezervāta teritorijas.

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Practice of Identification, Protection and Management of Landscapes of National Importance in Europe and Latvia

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Abstract. Landscape variability due to anthropogenic pressure poses a risk to the existence of valuable and unique landscapes. It once became the reason for raising the issue of landscape protection in Europe, paying special attention to landscapes of national importance by giving them a special status. In European practice, the granting of the status of a landscape of national importance to certain territories is based on a long tradition. In England and Scotland, it was started in 1949, separating nature protection and landscape protection directly into laws and regulations, and also later by identifying and mapping the country's most important landscapes, developing guidelines for landscape protection, planning and management, and setting up national landscape protection institutions. Later, in 1992, Finland also granted a special status to its particularly important landscapes. In general, this establishing method is similar to the UK experience. The experience of France, on the other hand, is based on exploiting the potential of the landscape for tourism, by branding specific landscapes and linking them in a single network. The traditions of European countries in identifying and managing landscapes of national importance are different, but they are mainly based on the desire of each country to highlight and preserve its special and important landscapes both as real territories and as symbols of national identity. This article analyses the understanding of national landscapes, comparing the examples of individual European countries, as well as the experience of Latvia, with the aim to determine the best basis and method for Latvia to identify, protect and manage national landscapes.

Keywords: landscapes of national importance, understanding of landscape, landscape protection, landscape management

Introduction

The essence of landscape of national importance includes, on the one hand, a broad and holistic framework of the concept of landscape, but, on the other hand, a very emphasised, symbolic and multi-layered basis of national consciousness, traditions and values. Landscapes include elements created by nature, man-made structures and emotionally-social connections. Thus, the question of studying and evaluating the landscape as a comprehensive phenomenon, which scientists actively used in their work, becomes relevant, recognising that landscape is not just the sum of individual landscape elements or phenomena, but there are more complex regularities between individual elements or indicators and their changes. Therefore, a holistic approach is needed [1; 18; 19; 24]. The holistic approach dates back to the early 19th century, when Alexander von Humboldt, one of the founders of geography, argued that the landscape was a comprehensive description of a region/place (*Landschaft ist das Totalcharacter einer Erdgegend)* [1]. On the other hand, taking into account the holistic nature of the landscape, there is a need for a multidisciplinary approach, where the landscape is not viewed from the point of view of one science, but regularities are sought when several branches of science intersect or meet. Scientists are trying to use the methods of natural sciences, social sciences, humanities and arts in landscape research, creating new methodologies for landscape research, where one of the tasks is not only to combine different methods, but also to create a deeper connection with society as a whole, perceiving it as an integral part and cognitive process. A multidisciplinary approach is particularly important in the identification of landscapes of national importance, as these landscapes are not only a set of physiographic elements and structures, but also have an emotional, symbolic and ideological dimension, as well as a link between all these aspects. In general, this is also reflected in the process of shaping the cultural landscape, which is in line with the concept of landscape enshrined in the European Convention – an area, as perceived by people, the character of which is the result of the action and interaction of natural and/or human factors. We call the set of emotional, symbolic and ideological dimensions in our daily life the ‘homeland’, which accurately reflects the form of the relationship between man and the landscape. The concept of the ‘homeland’ includes the expression of the relationship between man and nature through symbols, attitude, which is formed as the storage and cultivation of important events and symbols of the past, present and even future through the physical and mental dimensions of the landscape. The phenomenon of collective

memory or consciousness, as a fixed and visualised set of symbols, is most strongly reflected through the concept of the 'homeland' [13]. In this way, the landscape is like a repository that holds events important to the nation on the one hand and inspires or gives ground, a connection to the past, on the other hand.

Landscapes of national importance are often closely linked to the concept of national identity, which is influenced by national political events, the cultural and historical development of territories and the transformation of the landscape, as well as the geographical location of a place. The phenomenon of collective memory actively influences the expression and change of national identity over time [3; 10], which manifests itself in both cognitive and physical symbols in the landscape. The interrelationships and connections between the different social and ethnic groups of the territory are also important in the process of cognition of national identity, which is often studied by landscape researchers in order to find out the development trends of the population and spatial structure of the territory, distinguishing separate stages of landscape development, which are also marked by political and social processes, as well as economic development. Such processes can also explain new symbols of national identity, which are often reflected in the landscape [17]. For example, when studying historical events, the anthropologist Vieda Skultans points out a close connection with the changes and transformations of the rural landscape during collectivisation, which also strongly influenced people's memories, as most respondents associated childhood with being in the country, because most of the respondents remembered their childhood memories with idyllic rural landscapes and rural works, marking the landscape of Latvia a distinct agricultural country. V. Skultāns calls landscapes 'the warehouses of experience, with significant "luggage" of the past and future of the country and each individual'. There is a fine line here when we perceive the landscape as an objective reality, and when a particular landscape or type of landscape acquires a nuance of personal memories or events. Thus, landscapes of national importance can also be closely connected with experiences and memories important to a nation. For example, it is similar in art, where rural landscapes are depicted through the works of landscape painter Vilhelms Purvītis – as childhood memories – such 'soft, smoky and somewhat dreamy' [28]. The paintings of V. Purvītis "Winter", "Spring Waters (*Maestoso*)", "In Spring (*Blossom Time*)" and Ģ. Elias *"At the Well"* are included in the Latvian cultural canon and vividly mark the landscape of the beginning of the last century (*In Latvian: Latvijas kultūras kanons*). Along with printed literature and magazines, the Latvian rural landscape as a symbol of beauty was already introduced in the 1960s as a popular type of photobook. For example, the book "Dzintarzeme Dzimtene" (*Amberland Native Country*) (*Observations on the Nature and Culture of Latvia*), published in 1937, which was also published in later periods, included landscape views, as well. Later, maps with scenic places and cultural and historical objects were also released. The book "Nature and Landscapes of Latvia" by Kamils Ramans, published in 1971, is also rich in outstanding landscape illustrations. Such publications on the one hand popularised the landscape of Latvia and on the other hand, created a symbolic image of the landscape in people [25]. Even later, several publications were published about certain places, national parks and the Baltic Sea coast. These publications were rich in illustrations and supplemented with detailed descriptions of landscape structure, vegetation, cultural-historical and aesthetic values. For example, the book Gauja National Park by Aija Melluma of 1977 with photos by Aivars Āķis, describing the history, characteristics, zoning, etc. of the national park. The book Ancient Valley of the Gauja (*authors Āboltiņš, O., Eniņš, G.)* published in 1979 also provides an extensive description of the landscape of the Ancient Valley of Gauja Valley and its structure, and is rich in colourful photographs of the picturesque landscapes of the River Gauja. There were several such publications, later even whole series on natural values, of which the landscape was an integral part [11]. The promotion of the Latvian landscape through maps, picture books and research has influenced the human visual perception of landscape and strengthened the symbolic image of the 'attractive landscape' in the subconscious, creating a collective memory and understanding of landscape values, including the landscape as part of national identity. In his research, Edmunds Bunkše also notes the symbols of the rural landscape as a strong foundation of national identity, which helped to maintain and preserve it even during the Soviet era. He describes the following as symbolic elements of the rural landscape or landscape spaces: a farm with its own farm buildings, garden and agricultural land, pastures, set-aside, surrounded by forest or located by the sea; meadows full of flowers, where bees are buzzing; trees or tree clusters - oaks or birch groves; forests - diversity of plants and habitats of birds and animals; castle mounds with a long history; sea shore - steep shores, dunes and rocky sea shores; river valleys – the largest river valleys in Latvia – Daugava, Gauja, Lielupe, Venta [4].

Landscapes of national importance can also be a reflection in a regional context, most often through

architecture, culture, the spatial structure of nature or individual elements of the landscape. This link can be defined as two different directions - one with a very clear and distinct dominance of man-made or natural elements – castles, manors or other structures, even technical or engineering networks (roads, bridges, railways, HPPs), as well as very expressive natural elements and sets of elements - steep banks, caves, river valleys, other distinct relief forms, rock outcrops, expressive vegetation, water bodies or watercourses, etc. The second direction is the overall structure of the intangible landscape, which consists of many nuances, layers, both visible and intangible and emotional connections, often referred to as the sense of place, belonging (*Sense of Place/Genius Locci),* and also the identity of the place/landscape. These feelings are closely related to the subjective perception of an individual or a group, belonging to a country, nation, culture and traditions, even the emotional state, the season and the weather. Thus, creating a kind of mosaic-like emotion and physical 'pattern of matter', through which a person perceives the landscape from childhood, remembers it and further forms their own, very intimate associations and symbols. The combination of different factors and aspects proves that the emotional – symbolic representation of the landscape cannot be captured very statically – it is rather a variable and dynamic set of factors [5, 12, 29, 30].

As mentioned above, unique and traditional landscapes in Latvia as an integral part of national identity have been immortalised in paintings and other works of art, photo albums and magazines. But landscape protection began with the designation of Specially Protected Areas and the establishment of Protected Landscape Areas. In Latvia, landscape protection and assessment is implemented through several levels – protecting certain cultural monuments and territories, protecting natural territories, including characteristic and traditional landscapes within the framework of the National Parks; designating specially protected landscape areas; defining the canon of Latvian landscapes; implementing activities such as the Landscape Award and Landscape Treasures, where public participation and opinion play an important role. Landscape protection is a special phenomenon that is to be welcomed, on the one hand, because the state and the people want to preserve their natural and cultural values, but on the other hand, any protection shows a number of constraints that are a burden on both the municipalities and the people themselves. Of particular note is the phenomenon of 'private property' status, which often contradicts the common good of the state and its citizens, protecting only personal interests. The common understanding of the state and society about the protection of landscapes and the preservation of values, including in the context of various property rights and affiliations, significantly influences the identification of landscapes of national importance and the determination of their special status in Latvia. Landscape Policy Guidelines 2013–2019 include a definition of landscape-valuable territories, which is explained as 'territories determined in the process of development planning, in which, according to the public assessment, landscapes important for the sustainable development of Latvia, its regions, counties, people and places are found'. This definition highlights the value of the landscape that is essential for society, which is revealed through several interrelated levels – regional and local identity, the perception of the subjective landscape values of each individual and society. In addition, these valuable landscapes must be seen in the context of sustainable development, thus being considered as a development potential at the level of the state, regions and individual municipalities.

Until now, the promotion and protection of values of national importance in Latvia has been considered in the context of natural territories for natural elements and objects under the control of the Nature Protection Board, as well as historically significant cultural monuments under the responsibility of the National Cultural Heritage Board [16]. One of the challenges of the future in Latvia is to develop an integrated approach to the landscape of national importance for identification and granting status, taking into account not only the natural and cultural-historical aspects but also the landscape holistic and versatile (multifaceted) nature, which also includes other important aspects. Thus, the aim of the article is to analyse and compare the existing experience of identifying and strengthening national landscapes in Europe, highlighting the approaches that can be adapted to the conditions of Latvia in accordance with the existing regulatory framework, available data, landscape research traditions and public understanding.

Material and Methods

Method

Based on the research of the scientific literature presented in the introductory part, as well as the common experience of the authors' teams in landscape research [15; 20; 21; 22; 23; 34], a model for understanding landscapes of national importance has been developed. According to the model, the experience of other European countries is analysed with the aim of summarising the best approaches and adapting them to the conditions of Latvia.

In the sense of national landscape, cultural history (events, personalities, periods), traditions,

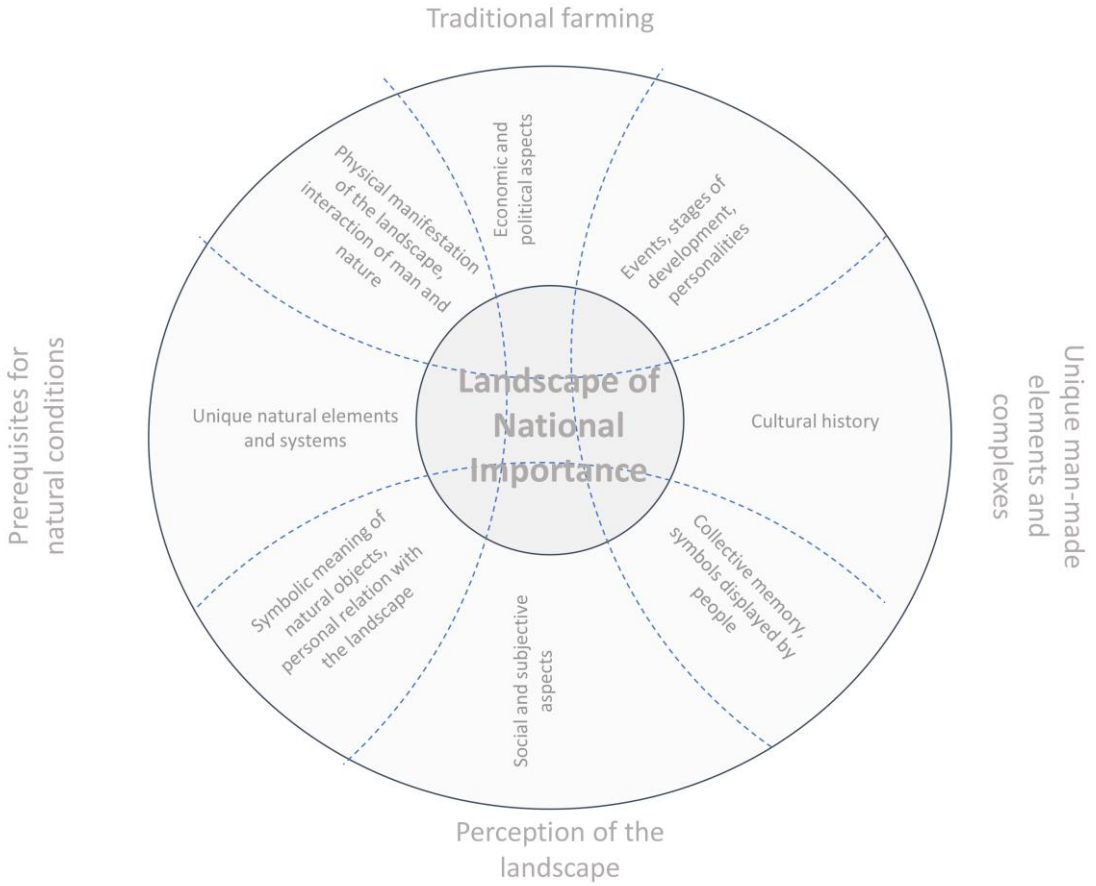

Fig. 1. Model for understanding the landscape of national importance [created by the authors]

culture, traditional management, social aspects, symbolic significance of natural elements and man-made objects, cognitive landscape awareness, collective memory, each individual's close connection with his and her own place of residence and other aspects of ancestors, in general creating a significant national heritage for the country, which is reflected in the multifaceted and holistic nature of the landscape (Fig. 1).

The landscape is based on four layers/groups, which are intertwined and cannot be separated in the common definition of the understanding of the national landscape:

- Prerequisites for natural conditions – the base of nature, which is unique and can be a whole complex of nature – a wide area, as well as a unique natural formation;
- A set of man-made elements that is related to the cultural and historical development of the landscape, human economic activity, and can be both a complex of objects of outstanding architecture and individual unique and outstanding structures in the context of the surrounding landscape;
- Perception of the landscape, in which both the collective memory and the subjective perception of the landscape of each individual, as well as the symbolic meaning of the landscape are layered;
- Traditional farming – affected by economically-political aspects and traditional farming within the framework of natural conditions characteristic for each region, traditions and culture, community and place, resulting in unique or traditional landscapes for a given place.

All these layers are interconnected and influence each other, thus forming a holistic and development-orientated understanding and definition of the spiral landscape of national importance, rather than linear or sequential.

Research objects

The publication analyses four different approaches to the identification, protection and management of landscapes of national importance, analysing the experiences of England, Wales, Northern Ireland, Scotland, France and Finland. Each of the analysed experiences in the identification, protection and management of landscapes of national importance is different. Thus, in the search for the most appropriate approach, which could be applied in Latvia in the

future, a brief description of each country's experience and traditions is given, further carrying out analysis in three blocks – identification, protection and management of national landscapes, each of which is analysed through a model for understanding the landscape of national importance.

In England, Wales and Northern Ireland, Areas of Outstanding Natural Beauty have been designated with government support. These landscapes are defined as unique and distinct landscapes with a natural or landscape appeal that are of sufficient value at the national level. In England, Wales and Northern Ireland, 46 such landscapes have been identified. They cover 18 % of the country's territory and are mostly located on the coast in the south and north, less in the middle [2]. It should be noted that the very existence of the concept of 'natural beauty', which is not precisely defined in documents, has always been a contentious issue, based on the prevailing view in the 18th century that many man-made objects, landscapes and the human body itself are considered to be 'natural beauty'. Such a concept has influenced many judgments and definitions in the legislation of the past, as well as in public opinion; today the concept is legally unprotected and easily disputed.

In Scotland, the National Scenic Areas are distinguished as outstanding scenic values in the context of the country with the need to protect them. The aim of this status is to identify/determine landscape values and a set of protection measures aimed at monitoring and managing the development of these landscapes. In 1978, a total of 40 Protected Scenic Areas were identified by the Countryside Commission for Scotland, publishing it in a single document – 'Scotland's Scenic Heritage' [27]. In total, these landscapes cover about 1 million hectares (13 % of Scotland). For each landscape area, the boundaries are marked on the map M 1:50000, including settlements, natural areas and water areas. In Scotland, the status of a National Landscape Area is equivalent to that of the status of a National Park. These landscapes symbolically reflect the Scottish traditional landscapes directly through associative perception as the canon of national landscapes. No new landscapes have been added to this list since 1978, also without changing the boundaries of the landscapes. It was only in 2010 that a new report was prepared based on the research carried out in 2007–2009, repeatedly surveying all territories and characterising their quality [26].

In France, on the other hand, the Grand Site de France landscape quality brand has been awarded to several territories and their number increases. The Réseau des Grands Sites de France (*Network of Outstanding Landscapes in France)* is responsible for granting the status. Granting the status promotes the development of tourism and additional support for the development of territories. This brand is owned by the State of France (*registered in 2003*), which applies the principles of sustainable development in landscape management. The 'Grand Site de France' brand guarantees that the site is preserved and managed in accordance with the principles of sustainable development, which combine the preservation of the landscape, the special aura of the landscape (Sense of Place), the quality of the visitor experience and recognition. Residents and entrepreneurs who operate under this brand or in accordance with the development plan are supported, thus maintaining the status of a landscape value area [32]. The Ministry of Environment and Sustainable Development performs the administrative function. It was an important step in showing that the State of France recognises the importance of these truly inspiring landscapes and is committed to the long-term management of such areas [32].

In Finland, the tradition of landscape research is more than 100 years old. In 1920, the geographer Johannes Gabriel Granö carried out a systematic analysis of landscapes, influenced by the German experience (Landschaftskunde), with an emphasis on the importance of visual criteria for landscapes. J. Grano created a mapping of landscape regions, as well as defined the meaning of the landscape in the Finnish context, which influenced the understanding of the landscape and the use of the concept in the country as a whole. In addition, the dimensions of the spatial structure of landscapes were defined, as well as their representation in cartography, introducing a new concept – micro-environment, or small-scale landscape (*Finnish – Nähe*). Already in the 1980s, the concept of landscape ecology was introduced in Finland, which facilitated the expansion of landscape research into ecology, and later into the study of the sociological and cognitive aspects of the landscape through multidisciplinary research [14]. There are 156 areas in Finland classified as landscapes of national value/importance that were marked in 1995. Their value is based on culturally and historically significant natural diversity, traditional agriculture and architecture. According to the Finnish Land Use and Construction Act, valuable landscapes must be taken into account when planning the site. However, rural landscapes are threatened by the loss of biodiversity, the collapse of buildings and unsuitable new construction projects that do not respect traditional architecture. In addition, the landscape is threatened by changes in traditional agriculture, extinction. By designating landscape areas as a value on a national scale, the aim is to ensure significant and viable rural landscapes and to stimulate public interest in sustainable landscape management [9].

Results and Discussions

According to the National Landscape Understanding Model, which includes four main blocks: nature, man-made objects, management and landscape perception, four different approaches to the identification, protection and management of national landscapes were analysed (*examples of England, Wales, Northern Ireland, Scotland, France and Finland).*

Approaches to identifying landscapes of national importance

In England, a methodology for landscape assessment and management has been developed. This legal status of the landscape is equated to the status of National Parks and Protected Nature Areas, where landscape protection decisions are a priority and binding on local governments. In general, the landscape assessment methodology in England for the protected areas is based on the worldwide Landscape Character Assessment. However, the following criteria have been set for the inclusion of landscapes on the list of outstanding landscape areas:

- a qualitative indicator of the landscape, where the natural or cultural-historical landscape is of authentic quality;
- the visual quality of a distinctive landscape, such as distinct coastal terrain;
- relative 'authenticity/naturalness', with minimal interference with modern buildings and infrastructure;
- relative 'peace/quiet', where natural sounds are not suppressed by industrial ones;
- distinctive features of 'natural assets/heritage', such as different geology, species or habitats;
- cultural heritage that includes buildings or their remains and is a unique human formation [2; 31].

In Scotland, the authors of Scotland's Scenic Heritage document, examining a number of landscape assessment methods and achievements so far, as well as the expert method developed specifically for landscape assessment (*based on the analysis of cartographic materials*), recognise that they do not consider it to be fully useful, and the landscape assessment is often a subjective assessment. In assessing the landscape, the developers relied on a kind of beauty canon with the features characteristic to landscapes – a diverse landscape structure, expressive and impressive relief forms, coastline, lakes and rivers, as well as culturally and historically significant landscapes. Such parameters can be very briefly defined as 'landscape grandeur and excellence' – distinct geological forms, naturalness and peace, cultural and historical significance and man-made elements. It must be acknowledged that these landscapes may not have a pronounced diversity of ground cover or vegetation, but may be compensated by the presence of pronounced terrain or water. Most of the landscape was identified in the north of Scotland (*Highland area*). The assessment is based on a survey based on an analysis of various sources and information on landscapes that could qualify for landscape areas of national importance – a survey of a number of professionals who are in the landscape or manage and plan them on a daily basis, including both public authorities and non-governmental organisations, and surveyors who visited various landscapes during the surveys.

In France, the landscapes awarded this brand are described as authentic, remarkable, outstanding, scenic, attractive and iconic, with an exceptional, unique, singular character and a close link to the history and development of a given place, preserving the traces of the past, but also in dialogue with the future, which is the key to landscape development. Of particular note is the combination of two terms for these valuable landscapes – 'landscape' and 'heritage', with an understanding of the value of nature, but without emphasising the importance of biodiversity or geological values and uniqueness, because other laws and territories are in operation, where the focus is on the protection of natural values. Great emphasis was placed on the concept of the Sense of Place, which was one of the hallmarks of establishing an outstanding landscape brand. The aura of place lies in both tangible and material, as well as spiritual and mental values, combining both objective evaluation and the sensual and subjective evaluation of the individual, or the ‘experience’ of the landscape. Phrases such as 'breath-taking' or 'feeling small compared to the majesty of nature' have been used to describe this subjective assessment; landscapes that emotionally thrill, inspire and evoke a range of feelings and experiences. Preserving these intangible assets requires a great deal of experience and understanding of the landscape, seeing those elements of the landscape that allow each visitor to clearly feel and experience the place by seeing the elements and symbols of the landscape. It is emphasised that the protection of the landscape does not involve excessive restrictions and efforts to create 'landscape museums', but to allow the place to be alive and to place part of the responsibility for landscape values on the shoulders of the French people as part of patriotic values.

In **Finland**, the tradition of landscape research is more than 100 years old. In 1920, the geographer Johannes Gabriel Granö carried out a systematic analysis of landscapes, influenced by the German experience (*Landschaftskunde*), with an emphasis on the importance of visual criteria for landscapes. J. Grano performed mapping of landscape regions, as well as defined the landscape in the Finnish

TABLE 1

A summary of the main principles for the approaches to the identification of landscapes of national importance [created by the authors]

Countries whose approaches have been analysed	Prerequisites for natural conditions	Unique man-made elements and complexes	Traditional farming	Perception of the landscape
England, Wales, Ireland	Widely included (natural beauty, authenticity, peace, tranquillity)	As the harmonious coexistence of nature and man	There is a direct link with traditional management, the landscape as a potential recreational resource	Landscape aesthetic quality criteria, 'Sense of Place', positive image and symbolism
Scotland	Are included, but emphasising that diversity is not always the determining factor, comparisons of landscapes are not allowed	Based on gathering expert opinions, however, without emphasising each object, but the holistic nature of the landscape	Opinions from managers and administrators have already been taken during the evaluation phase	The subjective component of landscape assessment is recognised, as experts relied on their subjective beauty canon
France	Emphasised to a smaller degree. There is no emphasis on the quality of biodiversity	The importance of heritage is particularly emphasised	Less emphasis is placed on landscape valuation, but adherence to sustainable principles is essential	Great emphasis is placed on the existence of 'Sense of Place' and goodwill
Finland	Emphasis is also placed on regional differences to represent all types of landscapes	Great emphasis on traditional architecture	The preservation of agricultural land in open landscapes was important in the evaluation	The meaning of a harmonious image that is able to reflect local characteristics

context, which influenced the understanding of the landscape and the use of the concept in the country as a whole. In addition, the dimensions of the spatial structure of landscapes were defined, as well as their representation in cartography, introducing a new concept – micro-environment, or small-scale landscape. Already in the 1980s, the concept of landscape ecology was introduced in Finland and the landscape research into ecology direction was expanded, and later into the study of the sociological and cognitive aspects of the landscape through multidisciplinary research [14]. Landscape assessment is based not only on the peculiarities and characteristics of the territories, but also on the regional division of landscapes. The division was established in 1992, dividing Finland into ten regional landscape areas/districts based on regional differences in natural and cultural characteristics. Landscape areas/districts are selected to reflect the most important landscape features of each region. The working group, chaired by Antti Haapanen, a Finnish landscape researcher, produced two reports in 1992 and 1993 on descriptions of the values of valuable landscape areas and on landscape protection. The Working Party emphasised that landscape protection can be achieved through landscape management and that these two documents are an integral part of the common goal of landscape protection.

A summary of the main principles for the approaches to the identification of landscapes of national importance is presented in Table 1.

Protection of landscapes of national importance

Protected landscapes of England include a variety of natural sites, determined by the diverse nature of England – mountains, river valleys, coasts, forests, hilly ridges. Landscapes are not only valued as a view or image, but also include the diversity of relief forms, geological objects, vegetation and

living organisms, as well as the history of human-nature interactions. In the example of England, it is the person and their activities that are emphasised as important in the existence of the landscape, and it is mainly the farmers who take care of the management of the landscape. Maintaining the authenticity of the landscape depends on them, as landowners, also supporting the development of tourism through the attractiveness of the landscape [2].

In **Scotland**, the status of a National Landscape Area is equivalent to that of the status of a National Park. These landscapes symbolically reflect the Scottish traditional landscapes directly through associative perception as the canon of national landscapes. No new landscapes have been added to this list since 1978, without changing the boundaries. It was only in 2010 that a new report was prepared based on the research carried out in 2007–2009, repeatedly surveying all territories and establishing their quality [26].

In France, the aim is to combine the protection of landscape values with the hospitality of a place and the preservation of life, so that populated rural areas are not abandoned. It is dynamic preservation, where the locals and their occupation are the key to success in developing and preserving the landscape. In addition, emphasis is placed on the availability of landscapes, independence from cultural affiliation and income. No less important is an opportunity to simply 'just be' in the landscape without restrictions or ready-made programmes, to communicate with the population and feel the values of the landscape, create one's connection with the landscape, return someday and share emotions and memories. Despite the attractiveness of the place, the development of outstanding landscapes must maintain proportionality and balance without transforming these areas into mass tourist destinations, which can permanently disrupt the intimacy of the landscape and the aura of the place [6]. Giving a brand to a particular place is a guarantee of its sustainable development, limiting uncontrolled urbanisation processes, prioritising the well-being of the population and the interest in the existence of the landscape. However, developers see a number of risks – speculation in the value of property in such areas, as well as excessive commercialisation and pressure, as these landscapes cannot be commercial projects with huge profits, but economic growth must be able to keep people interested and participate [6]. In France, there is a Policy of the Grand Sites of France, which provides a basis for combining the efforts of the state, local authorities and owners to protect, plan and manage these areas, based on the experience of the last 30 years of cooperation. According to this policy, a development plan is prepared every 10 years, which includes the main directions of activity, and which also combines the action strategies of the stakeholders and allows them to act more specifically in each of the landscapes, but below the big goal and tasks. The landscape development plan describes the specific values to be preserved in each landscape, which are approved by the management and the parties involved [6].

Section 5 of the Nature Conservation Act sets out the procedure, status and protection rules for the creation of protected landscapes in **Finland.** Landscape protection zones in Finland can be established to preserve and manage natural or cultural landscapes of outstanding 'beauty', historical or other special value. The Landscape Protection Order may be revoked or allow deviations, if the landscape value has significantly decreased or if its protection does not allow implementation of the project of national interest that is of great public interest. The Ministry of the Environment is responsible for the overall supervision of nature and landscape conservation. The Centre for Economic, Transport and Environmental Development promotes and monitors the conservation of nature and landscapes within its jurisdiction. Provisions necessary for the preservation of the characteristic features of protected landscapes may be included in the decision on the establishment of the site, but it is also important to balance the interests of the owners. In certain cases, the Centre for Economic, Transport and Environmental Development may grant derogations from the prohibitions in force in the relevant landscape protection area – Amendments to the Nature Protection Law. The amendments to the act provide that the Centre for Economic, Transport and Environmental Development may, in certain cases, grant an exemption from the regulations relating to a landscape protected area. In addition, the rights of the responsible institutions have also been adjusted – the Ministry of the Environment decides on the creation of a nationally important landscape territory and the purpose of its preservation. The decision on the territory of other landscapes based on the proposal of the regions is decided by the Centre for Economic, Transport and Environmental Development [8].

A summary of the main principles of landscape protection approaches of national importance is presented in Table 2.

Landscape management of national importance

In England, the management function is assigned to the following institutions: Natural England – in England; Wales Natural Resources – in Wales; Northern Ireland Environment Agency – in Northern Ireland. In partnership with local authorities, Natural England is responsible for all

TABLE 2

A summary of the main principles of landscape protection approaches of national importance [created by the authors]

Countries whose approaches have been analysed	Prerequisites for natural conditions	Unique man-made elements and complexes	Traditional farming	Perception of the landscape
England, Wales, Ireland	Management plans have been prepared in the context of adjacent areas	Are included with a stronger emphasis on the link between objects and the overall picture of the landscape, Charities are also involved	There are recommendations and guidelines as well as support mechanisms	Included to a small extent with more emphasis on specific activities and elements, less on the importance of perception
Scotland	Implemented by the NatureScot agency with an emphasis on the seamless protection of nature	In general, construction, as well as the building of new roads is governed, but the restoration of cultural and historical objects is supported	Emphasis is placed on preserving the values of each landscape through a variety of protection mechanisms	Preserving the emotional component of the landscape is important
France	The awarded Landscape Quality brand as a guarantee for landscape protection	What matters is dynamic preservation, not conservation, with an emphasis on the local population	Conservation status is at the same time support for local businesses operating in accordance with landscape protection requirements	Preservation of the sense of place
Finland	Accent placed on the interconnection of natural elements, emphasising the ecological and geomorphological links of the landscape	The protection of historic buildings is especially emphasised	Traditional management techniques are included	Role in preserving national identity. Strengthened every year by celebrating Landscape Days

regulatory processes, coordination and establishing borders. A landscape management plan is also developed for the area, which is revised every five years.

The landscape management plan includes a description of the landscape, distinguishing uniqueness according to certain criteria; linking with existing planning documents; descriptions of scientifically important sites and possible activities; development and action plans with the responsible parties and the allocated funding; monitoring plan and reports [2]. Landscape management plans are published on public websites. Each site has its own website, where detailed information about the site, possible activities, management plan, other binding documents, as well as information about the involved projects, etc. is available [33]. The documents and guidelines emphasise the importance of partnership, which allows for the more successful and optimal development of strategic documents, defence of landscape protection interests, implementation of both joint projects and daily landscape management works, sharing of experience with each other, as well as ensuring more successful education and information, advertising and fundraising activities in different territories.

TABLE 3

A summary of the main principles of landscape management approaches of national importance [created by the authors]

Countries whose approaches have been analysed	Prerequisites for natural conditions	Unique man-made elements and complexes	Traditional farming	Perception of the landscape
England, Wales, Ireland	The management function is assigned to the agencies - Natural England Northern, Ireland Environment Agency, Natural England	Individual management plans for each element, involving owners, managers and society	Directly related to management, landowners, leaving room for innovative types of management	Landscape management plans include a description of the landscape, emphasising its uniqueness, based in particular on the importance of partnership - hence the common trade-off between landscape perception
Scotland	Closely related to man-made elements as a common image of landscape	Associated with protection and regulations relating to construction	Municipalities are entitled to develop their own management plans, but traditional farming is not emphasised	Through the preservation of the overall image of the landscape, which provides specific emotions
France	Gentle development of the landscape, understanding that unique landscapes are a process of interaction between nature and man	Balance between cooperation, development and conservation, open communication, with an emphasis on tourism development	Emphasis is placed on management according to sustainable development principles	A special concept 'just be' has been introduced, bringing of landscape in intangible level is important
Finland	Already listed in the management plans and in accordance with the Nature Protection Law	Emphasis is placed on promoting the public interest in traditional architecture through tourism	Essential coordination and balancing of the interests of owners and operators	Through public interest and co-responsibility

In addition, communication with the public in various directions is provided. The members of this partnership set a number of goals to be followed by the staff of the management organisation – coordination, strengthening of priorities and objectives, distribution of impact, introduction of advisory and support principles (*for local producers, artisans, farmers, etc.)* and monitoring [2].

It is managed by **Scotland's** Nature Agency (*NatureScot*). Additional control has been established for national landscape areas for certain activities - construction of farm buildings over 12 m, as well as construction of new roads and railways, if this has not been agreed in previous plans and exceeds a specific budget. Municipalities may develop additional landscape protection, development and management strategies, but by 2018 only three of such strategies have been developed. The act provides for the free use of these areas by the public, regardless of affiliation (except in some areas), which includes a wide range of activities related to active tourism, but with a responsible attitude towards landscape values already regulated by other legislation (*Scottish Outdoor Access Code*) [26].

The management of the outstanding landscapes of **France** is a collaborative activity where the balance between development and protection, open communication, meeting the public interest and anticipating the impact of possible actions is the key to success [6]. In general, landscape management is closely linked to the development of tourism.

A number of materials and programmes have been prepared for tourism development to help locals engage with traditional or unique products and services. Landscape management as a process is an integral part of landscape protection, which allows the landscape to be gently developed through a set of actions, creating a balance between the influences of different interests. A relatively large part of landscape management activities is occupied by educational activities, which allows the avoidance of mistakes in the implementation of landscape management and uniting of stakeholders, helping to develop an adequate perception and understanding of the landscape through cultural, historical, ecological and spatial values.

In **Finland,** the landscape management system involves a number of interest groups; not only the owners of the site, the administrative authorities, but also society, where educational activities and access to information play a no less important role. Recognising that landscape management requires financial investment, the Finnish government diverts funds intended as subsidies for overproduction. In 1995, a government decision was prepared on the protection and management of protected landscape areas by agreement between several ministries, forest and rural development and support institutions, research institutions and the municipal association [7; 9].

A summary of the main principles of landscape management approaches of national importance is presented in Table 3.

Analysing the different national approaches to the identification, protection and management of landscapes of national importance, it should be noted that information resources, political commitment, a clear separation or delegation of the necessary functions, as well as public participation are important. As the experience of other countries proves, also in the context of Latvia, the establishment of a normative framework and granting of the status of landscapes of national importance alone will not be able to ensure the sustainable development of such territories. At the same time, support mechanisms/programmes for the development and conservation of these areas need to be promoted and established, as well as public awareness and participation in these processes needs to be facilitated.

Conclusions

Experience of Europe in identifying, conserving, planning and managing landscapes of national importance varies from country to country and is based on planning and nature conservation traditions, national administrative divisions and management tools, as well as the regulatory framework. However, some basic principles can be put forward that are common to all countries:

- landscapes of national importance must be preserved, and their status has been approved in regulatory documents, in many places equivalent to the status of National Parks;
- the methodology for determining landscapes of national importance includes several stages – compilation of a list of potential landscapes to be assessed, collection of information, participatory assessment, survey of landscapes in nature, expert assessment, definition and approval of landscape values;
- administrative, consultative and co-operative organisations and units have been established for landscape management, which are responsible for the conservation, planning and management of the landscape, organising the whole process as an open type of communication, co-operation and participation process;
- the landscape management plan is one of the documents to be developed for each landscape of national importance, as an integrated medium-term planning document with an action plan, its own budget, the legal framework of the parties involved and cooperation partners.

Experience of Latvia in identifying and protecting landscapes of national importance has begun with the designation of Protected Landscape Areas, continuing landscape protection in several Specially Protected Areas, as well as protecting cultural heritage sites, later ratifying the European Landscape Convention and approving Landscape Policy guidelines, as well as working in parallel on multifaceted studies and projects that reflect the ecological, social and cultural aspects of the landscape. In general, wide and varied experience is difficult to summarise and analyse due to the lack of uniform methodologies or quality criteria, but it is a good basis for identifying and evaluating potentially valuable landscapes with a wide range of information. Experience of Latvia in landscape conservation is mainly based on the nature protection regulatory framework and focuses more on the protection of species and habitats, looking at the landscape as an ecological basis, thus, in Latvia, it is necessary to develop and integrate the regulatory framework for landscape conservation, planning and management into the existing laws and regulations, as well as into the existing spatial planning system. Support programmes for those involved in the management of landscapes of national importance are also important in order to promote the sustainable development of these areas while preserving their values. The education and participation of decision-makers and the public will be crucial in this process. Thus, the process of landscape planning and management of national importance can be realised with the overarching goal of preserving the values of each landscape by setting quality criteria and developing landscape planning and management tools for each criterion, respecting the principles of participation and understanding of the landscape, and ensuring regular landscape monitoring.

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Kopsavilkums. Eiropas pieredze nacionālās nozīmes ainavu noteikšanā, saglabāšanā, plānošanā un pārvaldībā katrā valstī ir atšķirīga un balstās uz plānošanas un dabas aizsardzības tradīcijām, valsts administratīvo sadalījumu un pārvaldības realizēšanas instrumentiem, kā arī normatīvo ietvaru. Tomēr var izvirzīt dažus pamatprincipus, kas visām valstīm iezīmējas, kā kopīgas:

- nacionālās nozīmes ainavas ir saglabājamas, un to statuss ir apstiprināts normatīvos dokumentos, daudzviet līdzvērtīgi Nacionālo parku statusam;
- nacionālās nozīmes ainavu noteikšanas metodika iekļauj vairākus etapus – potenciālo vērtējamo ainavu saraksta veidošanu, informācijas apkopošanu, līdzdalībā balstītu izvērtēšanu, ainavu apsekošanu dabā, ekspertu vērtēšanu, ainavas vērtību definēšanu un apstiprināšanu;
- ainavu pārvaldībai ir dibinātas administratīvas, konsultatīvas un sadarbības organizācijas un vienības, kas atbild par ainavas saglabāšanu, plānošanu un pārvaldību, organizējot visu procesu kā atvērta veida komunikācijas, sadarbības un līdzdalības procesu;
- ainavu pārvaldības plāns ir viens no dokumentiem, kas izstrādājams katrai nacionālās nozīmes ainavai, kā integrēts vidēja termiņa plānošanas dokuments ar rīcības plānu, savu budžetu, iesaistīto pušu un sadarbības partneru likumisko ietvaru.

Latvijas pieredze nacionālās nozīmes ainavu apzināšanā un aizsardzībā ir aizsākusies līdz ar Aizsargājamo ainavu apvidu noteikšanu, turpinot ainavu aizsardzību vairākās ĪADT, kā arī kā kultūrvēsturisko objektu daļu, vēlāk ratificējot Eiropas Ainavu konvenciju un apstiprinot Ainavas politikas pamatnostādnes, kā arī, paralēli strādājot pie daudzpusīgiem pētījumiem un projektiem, kas atspoguļo ainavas ekoloģiskos, sociālos un kultūrvēsturiskos aspektus. Kopumā plaša un daudzveidīga pieredze ir grūti apkopojama un analizējama, jo nav vienādas metodikas vai kvalitātes kritēriju, bet tā ir laba pamatne potenciāli vērtīgo ainavu izvirzīšanai un izvērtēšanai ar plašu informācijas klāstu. Latvijā ainavu saglabāšanas pieredze pamatā balstās uz dabas aizsardzības normatīvo bāzi un vairāk vērsta uz sugu un biotopu aizsardzību, skatoties uz ainavu kā ekoloģisku pamatni, līdz ar to Latvijā ir nepieciešamas ainavas saglabāšanas, plānošanas un pārvaldības normatīvās bāzes izstrāde un integrēšana esošajos normatīvajos aktos, kā arī esošajā teritorijas plānošanas sistēmā.

Nacionālas nozīmes ainavu plānošanas un pārvaldības process realizējams ar virsmērķi – saglabāt katras ainavas vērtības, izvirzot kvalitātes kritērijus un katram kritērijam izstrādājot ainavas plānošanas un pārvaldības instrumentus, respektējot līdzdalības principus un veicinot ainavas izpratni, kā arī nodrošinot regulāru ainavu monitoringu.

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Synthesis of landscape and architecture as a means of expressing national identity

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Abstract. The article raises the issue of interaction between architecture and natural environment in the expression of the people's national identity. On the examples of different peoples' cultures means of expression of national color, characteristic landscape receptions are analyzed. The means of national identity expression on the Ukraine territory are studied in detail; the important role of open-air museums in this process is shown. The importance of preserving national identity in the modern conditions of globalization and international architecture is proved. The classical world principles of combining landscape and architecture as expressions of the country national identity are analyzed, as well as the ways of solving this problem in Ukraine by ways of organizing open-air museums, ethnographic corners and fragmentary use of folk motifs in modern parks.

Keywords: landscape and architecture, architectural environment, synthesis, means of expression, national identity

Introduction

The theory of architecture and urban planning considers the natural and architectural environment as a holistic complex system, the subsystems of which are in constant interaction and strive for harmonization and dynamic balance.

Modern global issues of human development cover the main areas of human social activity, economy and industry, energy, peaceful coexistence, health, economy, industry and technology, advanced space research, ecology and the natural environment. In particular, the environmental aspects of global issues focus on the causes and consequences of the natural ecosystems destruction, the need to preserve and restore them, climate change, human-made and anthropogenic impacts.

The United Nations Environment Program (UNEP) identifies areas of global environmental issues, including urbanization, human settlements, industrial development, energy production and consumption.

Modern ecological and architectural research aimed at identifying the laws of interaction in time and space of artificial and natural systems, their structure and functioning within the specialized areas of architectural ecology and urban ecology, made it possible to formulate general approaches to the study of urban ecosystems.

The issue raised in this study is actually relevant to many developed countries. Despite the undoubted achievements of globalization, convergence of cultures, international manifestations in all spheres of life and society, there is a reverse side of these trends, which are increasingly being talked about in the media and at the state level. The process of erasing cultural boundaries between peoples gradually leads to the leveling of national and regional characteristics.

Ukraine has also intensified efforts to revive national tourism, national traditions, rituals and crafts to awaken in young people brought up on global trends, interest in their own culture, cultivate national consciousness in society, and create a basis for new architecture and landscaping on a national basis. To this end, the authors have explored a very specific, but very important way to solve this problem by means of the synthesis of two equal components – natural – landscape and artificial – architecture. In order to obtain generalized conclusions, along with the peculiarity of such a synthesis in Ukraine, a similar aspect was considered in China and Japan.

Ukraine is currently developing a strong national trend in landscape design, primarily due to the fact that there is a large area that allows you to observe wildlife freely and in sufficient quantities, so there is no shortage of authentic natural environment, as Ukrainians are literally surrounded by nature.

The review of sources and field research identified a number of issues that need to be studied and analyzed:

- the synthesis of natural landscape and architectural object in Ukraine is not considered in comparison with similar synthesis of nature and artificial environment in other regions of the world;
- it is not determined that it is in the natural landscape of Ukraine that it expresses the national color in the greatest extent;
- a comparative analysis of examples of interaction "nature-architecture" in different nations has not been conducted;
- such interaction has been little studied on the examples of open-air folk architecture museums of Ukraine as an optimal means of expressing national identity by landscape properties and authentic objects;
- no specific recommendations have been formulated for modern architecture that would allow to organically combine modernity and tradition.

Matherials and Methods

The purpose of the article led to a specific selection of scientific research methods. Since the studied aspect is directly related to both history and ethnography, the methods of historical analysis, which allowed to analyze historical events, and ethnographic analysis methods, which allowed to investigate ethnographic and cultural features, were used. Because all ancient cultures are in one way or another associated with religions and philosophical teachings, which directly influenced both the symbolism of the formation and location of architectural objects and the natural environment around them, the methods of natural sciences and philosophy were involved. An important place among the applied methods is the method of comparative analysis, which allowed to compare national manifestations in architecture and landscape both within one country and between several different countries. The analytical method allowed to analyze the material and formulate reasoned conclusions and author's proposals. The text was supplemented by photofixation, which reinforced and argued certain theses of the article.

All processed scientific sources were combined into several groups. Since the first part concerned the foreign experience of maximizing the expression of national identity by means of a synthesis of architecture and the natural environment, China and Japan were chosen as classic examples. This group of sources is represented by articles and monographs by Chinese and European scholars and focuses on national landscape design. The works of the following Chinese scholars were studied on the topic of China: Li Chunqing [9], Wang Yi [25], Pan Jiaping [15], Tong Yu Zhe [19], Zhu Guang Yu [32], Jiang Zhenpeng [8], Xing Yue [27; 28], Fang Liqiang [1], Huang Wei [4], Pei Yuansheng [16], Wang Guanglong, Zhang Hangling [24], Zhou Weiquan [31], Liu Dunzhen [10], Zhao Guanghua, Qiu Mao [29], Zhu Junzhen [33], Lou Qingxi [12], Fang Zhirong [2]. Ukrainian and European scientists also co-authored the topic with Chinese scientists – M. Dyomin, A. Dmytrenko, Yu. Ivashko, M. Orlenko, T. Kuzmenko, D. Chernyshev and the Polish researcher D. Kuśnierz-Krupa [5–7;14].

In the part devoted to Japan, the publications of G. Shevtsova [18], N. Anarina and Ye. Dyakova [21], N. Vinogradova [22] were involved.

The second part of the article concerns Ukraine directly, so the works of G. Bulashev [34], de la Flise [35], H. Pavlutskyi [36], V. Shcherbakivskyi [37], S. Taranushenko [38], V. Vecherskyi [39–40], F. Vovk [41], N. Zakrevskii [42], P. Yurchenko [43], S.Kilesso [44], H. Lohvyn [45], V. Zavada [46] were studied; novels by I. Nechui-Levytskyi [47] and others, as well as articles by Ukrainian scientists on these issues – D. Chernyshev, A. Dmytrenko, Yu. Ivashko, T. Kuzmenko together with Polish scientists J. Kobylarczyk and D. Kuśnierz-Krupa [49–50] were analyzed. Ukrainian scientists together with foreign colleagues highlighted an important aspect of the direct impact of changes in the natural environment on changes in the perception of architectural style.

Synthesis of natural environment and architecture in China and Japan

China and Japan have traditionally been considered classic examples of maximum harmony between the natural environment and the artificial architectural environment. Despite the unconditional commonality of such a synthesis in these countries, we can say that the means by which national identity was traditionally asserted in these two countries were not completely identical, which was primarily in the different direction of these means. In China, the synthesis of the natural environment and pavilions was to express the idea of an ideal "paradise" space by means of traditional architecture, sculpture, decor and established techniques of landscape design, such as the inclusion of water bodies of different shapes and sizes with islands in front of lakes, individual natural stones and groups of stones, winding paths in the gardens, the constant alternation of bright and picturesque landscape paintings with fine detail, the use for landscaping of traditional Chinese trees, shrubs and flowers with appropriate symbolic meaning. The main feature of such a synthesis in China is the secondary nature of architecture in relation to the natural environment, which corresponded to the deep traditions of Taoism, Confucianism and later Buddhism.

Accordingly, with regard to China, it can be argued that there the landscape becomes an expression of the national characteristics of the people, and, interestingly, this is true both in relation to the man-made landscape of gardens and the natural landscape, because its features penetrate so widely and deeply into all arts poetry, painting, works of design, to artistically decorated household items – whether as poetic lines, or as ink painting, or as images on a screen, fan or vase – that acquire the role of a symbol of national identity.

A similar situation has developed in Japan, where the traditions of landscape design introduced from China in combination with the local Shinto religion and Buddhism, also introduced from China, have over time formed landscape traditions with signs of national identity. And although the design of Chinese and Japanese gardens has much in common, it is not the same: more colorful, detailed, created for aesthetic pleasure – in China and ascetic, with a minimum of simple elements, designed

primarily for internal dialogue, self-knowledge and meditation – in Japan. At the same time, non-man-made nature and man-made landscapes also become an expression of national identity in Japan. Suffice it to mention the numerous images of Mount Fuji, waves, trees.

Thus, we can conclude that in those countries where human was secondary to nature, and the laws of nature were considered the basis, in the synthesis of nature and architecture the main role was played by nature, and it was valued and elevated above the artificial space of architecture. That is why Chinese and Japanese poems are dominated by natural motifs and quite briefly mentioned as people and buildings.

Specifics of synthesis of natural environment and architecture in Ukraine

The above applies to ancient civilizations with the existence of polytheism and animistic religions. The specificity of Ukraine was that the ancient animistic beliefs and ideas after 988 – the date of the baptism of Kyivan Rus – were imposed Christian traditions based on monotheism, i.e. the recognition of one Creator. Therefore, in Ukraine it is more difficult to define the manifestations of national identity both in the symbiosis of "natural environment – folk style object" and specifically in this natural environment.

At all times, since the baptism of Kyivan Rus, the main object of expression of Ukrainian national identity has been the church, first wooden and then stone. National features were also expressed in public housing and outbuildings, but in ancient times the temple has always been dominant. It should be noted that due to constant raids, attacks, wars, different territories of Ukraine in different periods came under the rule of different states, under external influences, which certainly affected the list of specific national characteristics in each region of modern Ukraine. Also, it should be noted that Ukraine is very different in climatic zoning, topography, the presence of water bodies, forests, which determined the characteristics of the natural environment. That is why, if we talk about the synthesis of nature and architecture, in the Ciscarpathia or the Carpathians it will be a mountain landscape with spruces, among which on a meadow a wooden church with low tiers stands, the most similar to spruce and shingles; in Poltava region it will be alternating plains and hills with a slender church standing among flowering gardens in the middle of the village, surrounded by huts under thatched or reed roofs; in Polissya a low low-lying wooden church stands against a pine forest, among log dark houses scattered haphazardly by requirements. Thus, in contrast to China or Japan, Ukraine cannot single out one example of such a combination of natural environment and architectural object, which could be considered an expression of national characteristics of all ethnographic regions of Ukraine (Zhytomyr, Kyiv and Chernihiv Polissya, Left Bank – Slobozhanshchyna and Poltava region, Middle Dnipro region, Western, Central and Eastern Podillia, Ciscarpathia, Carpathians, Transcarpathia, South). At the same time, over time, a certain image of the building in its natural environment was formed, which was associated with Ukraine, and this happened mainly due to the works of artists, poets and writers. T. Shevchenko's poetry and short stories, I. Nechuy-Levytsky's short stories, numerous paintings, graphics and watercolors firmly fixed the image of Ukraine: a wooden or brick baroque elegant church on the square, around it – picturesquely scattered whitewashed houses under a thatched roof, cherry orchards and flower beds bloom all around, behind them are picturesque hills covered with dense forest, and somewhere nearby a river flows, winding like a snake.

However, under the influence of external factors as of the second half of the nineteenth century, the old Ukrainian village no longer always has signs of this national identity in combination with a characteristic natural environment and architecture with characteristic regional forms, as it was before.

Open-air ethnographic complexes as an optimal form of expression of national identity: the experience of Ukraine

The problem today is that it is almost impossible to fully embody the image of Ukraine's national identity by synthesizing the natural environment and folk architecture within the urban environment of a large city, such as Kyiv and Kharkiv. Most often we can observe the appearance of parks or squares with certain elements of national culture: the selection of appropriate plants, the use of traditional ornaments in wicker compositions, paving, and other decorations.

Much more opportunities to create the most popular color opens up within the open-air museums of folk architecture and life and ethnographic complexes.

There are several open-air museums in Ukraine, among which the oldest is in Pereiaslav, Kyiv, Lviv, Uzhhorod and Chernivtsi (Fig. 1).

Fig. 1. Windmill in the open-air museum in Chernivtsi [photo by T. Kashchenko, 2019]

Pereiaslav Museum of Folk Architecture

The oldest museum of folk architecture and life of the Middle Dnipro region was opened in 1964, it is located on the outskirts of the ancient city of Pereiaslav and covers an area of 30 hectares. This is a museum, which presents in detail the authentic architectural monuments of the Middle Dnipro region from ancient times to the beginning of the twentieth century. There are 13 thematic museums on the vast territory and there are about 200 monuments of different times and more than 30 thousand monuments of material and spiritual culture, from the Paleolithic and Kyivan Rus to the early twentieth century. 104 monuments of folk architecture in the museum's exposition date from the eighteenth and nineteenth centuries, here you can see 20 estates of different times, transported from different villages, with houses, farm buildings, traditional Ukrainian plants and flower beds. Visitors can see 23 workshops, tens of thousands of household items and tools.

As the natural environment has always played an important role in creating the Ukrainian national color, the museum has two artificial ponds and an arboretum, and around all the museum exhibits are flower beds.

The location of all buildings among the dense greenery adds a special flavor.

The exposition of the museum is divided thematically. The oldest buildings and objects are represented by stone women, reconstruction of the XI century dwelling from Pereiaslav region, XI century dwelling from the village of Sosnova – also in Pereialavshchyna, reconstructed fragment of the Late Paleolithic site from the village of Dobranychivka of Yahotyn district in Kyiv region, Polovtsian sanctuary of the end of the XII – beginning of the XIII century from Chaplynskyi district, reconstruction of a fragment of housing and economic buildings of the X century on the Podol in Kyiv. The section of exhibits of ancient times presents a reconstruction of a fragment of a Late Paleolithic site (15,000 BC), located on the left bank of the Supa River, where four complexes belonging to the mammoth hunter tribe were studied, and the remains of one of the complexes became part of the open-air museum's exposition includes reconstructed dwellings in the form of frame huts covered with mammoth skins and mammoth bones as structural elements, bone pits, and a primitive workshop.

Despite the fact that the main exposition concerns the Middle Dnipro region, there are also exhibits of the southern regions of Ukraine. The museum presents ancient sarcophagi of the Kemi-Obin culture of the IV century BC, which were installed under high mounds, exhibits of pit cultures and Scythian sculptures, stone sculpture of the southern tribes of the Ukrainian steppes – Torks, Polovtsians and Pechenegs (X–XIII centuries) – in the form of standing, sitting and busting men and female sculptures, the most common of which were full-length female figures, the so-called "stone women". The reconstructed Polovtsian sanctuary with two authentic stone figures dating from the XII–XIII centuries is also included in the same thematic section.

This section presents the reconstruction of the dwelling of Kyivan Rus – a single-chamber dugout of Pereiaslav craftsman of the XI century with walls of pine hewn wood, gable roof with a hewn roof and gabled windows, adobe kiln and reconstruction of simple furniture, and reconstructed century with wickerwork, plaster and whitewash, the roof of which is covered with reeds. The reconstructed exhibits also contain some authentic fragments.

The most widely represented buildings of various purposes, dating from the sixteenth and nineteenth centuries. The most important place among the objects is occupied by several traditional Ukrainian wooden churches, moved from different villages – the church of St. John the Theologian from the village of Ostriyky in the Bila Tserkva region (1606) transported from the village of Bushevo wooden tiered bell tower (middle of the eighteenth century), the church of St. George from the village of Andrushi in the Pereiaslav region (1768), painted by T. Shevchenko, the church from the Stavyshche district (1775), the church in the village of Pyshchyky from Skvyra district (1651) – museums of the history of the Ukrainian Orthodox Church and a traditional towel (rushnyk) were opened in the last two churches.

It is worth noting that the preservation of the authentic appearance of the natural environment around the transported wooden churches helps to create the impression of their historical authenticity and maximally creates a folk style atmospere. For example, the oak church in the village of Ostriyky stands on a meadow, surrounded by trees, and traditional stone crosses have been installed in the churchyard. And the church from Stavyshche district seems to be hidden among tall spruces, which with their vertical outlines strengthen the slenderness of the church. The church of the village of Pyshchyky also stands on the lawn, around which the trees have risen.

The exposition of the Pereyaslav Museum presents authentic manors of the Middle Dnipro region – estates of a priest, potter, cooper, weaver, carpenter, witch doctor, social status – estates of a poor man, middle-rich peasant, wealthy peasant, including a peasant-craftsmen and widow. The house of the village council from the village of Viunyshche in the Pereiaslav region, dating from the second half of the 19th century, and a tavern from the village of Rudyakiv in the Pereiaslav region at the end of the 19th century were transferred to the

exposition. In the exposition of this period the Cossack fortress, surrounded by a moat 6 m wide, was recreated, an earthen embankment was built over the moat, on which a pointed oak fence was installed. There is a watchtower above the entrance gate. Reconstructed stable buildings and Cossack dwellings were erected inside the fortress. To create the most authentic perception of the Cossack fortress to the left of it on a hill, a traditional Cossack watchtower was recreated.

An integral part of the landscape of the Ukrainian village were windmills-mills, of which there are as many as fifteen in the exposition of the Pereiaslav Museum. In the Dnipro region there were two types of windmills for grinding grain – pillar-type and hip-type. The exposition of the museum includes separate thematic museums directly related to the history of culture, beliefs and prominent figures of the Ukrainian nation.

In 1989, a specialized museum of Ukrainian folk rites and traditions from pre-Christian times to the present was opened. We have already mentioned the Museum of the History of the Ukrainian Orthodox Church in passing: icons, old religious editions, portraits of religious figures of Ukraine and hetmans are exhibited here.

In 1995, the first visitors were received by the Towel Museum, which exhibits more than 300 traditional towels of various embroidery technology from Polissya, Kyiv, Chernihiv, Cherkasy, Poltava regions (a total of more than 4,000 towels, each with a unique symbolic embroidery ornament).

An original museum of local medicinal plants is presented in the building of the glazed greenhouse. In front of the main facade of the museum and on the lower terrace there are phytoplantations of medicinal plants. In the first hall the house of the witch doctor was reconstructed, in the second hall there are racks with pots with plants and a unique herbarium of plants of the Middle Dnieper region is presented, information stands are located. In the third hall grafting, plant starting and cultivation of seedlings are carried out, perennial exotic plants grow here.

A museum of beekeeping operates in an authentic house from the village of Pomokly in the Pereiaslav region. This is a traditional log house, consisting of a room, halls and pantry, in the yard there is a barn for storing honey and beehives, a cellar under a thatched roof for overwintering the apiary and a beehive in a hollow tree. The exposition of the museum includes icons of the patron saints of beekeeping, inventory, and literature on beekeeping.

In the museum of decorative and applied arts in the former landowner's house of the end of the XIX century from the village of Starovychi in Kyiv region in five halls works of famous folk masters are exhibited – wood products, woven products, carpets, pottery, toys, household tools, glass and crystal products with paintings, etc.

In 1979, a space museum was opened in the church from the village of Vyunishche. The museum presents models of spacecraft, spacesuits, the current model of the Baikonur Cosmodrome, specific space devices, photos.

The museum of land transport is also thematic, where the only collection in Ukraine presents different types of transport from the times of Trypillia culture, Scythians, nomadic tribes. There are summer and winter vehicles, technical means of its manufacture, the principle of operation of the workshop and smithy, which produced various types of vehicles – carts, sledges, phaetons, crews. Here you can see a reconstructed chumak's oxcart of the eighteenth century.

The "Post Office" museum, opened in 1993, recreates authentic 19th-century furniture in the premises of a real old post office in Pereiaslav.

Opened in 1984, the Museum of Bread presents the process of development of agriculture in Ukraine and the technology of baking bread from ancient times to the present. Here you can see a unique collection of wheat of ancient times, Trypillia agricultural pottery, agricultural implements, samples of grain and bread. The furniture of the second half of the XIX century is recreated in the adjacent baker's house, authentic household items are presented. Traditional agricultural machinery is exhibited in the open area.

In 2004, a museum of memory of Polissya district was opened, dedicated to the resettlement of villagers from the Chernobyl Exclusion Zone.

Also in the open-air museum there are museums of famous people of Ukraine – N. Bernados – the inventor of electric double welding of metals, and the writer Sholom Aleichem. Thus, if we describe the principles on which the folk-style exposition of the Pereyaslav open-air museum is built, it is:

- limitation to a certain ethnographic region of the Middle Dnipro region, but emphasis on its development from ancient times to the present (other regions are represented in fragments);
- complexity of exposition construction: thematic zones, thematic museums located in chronological order;
- location of all objects in the authentic natural environment of trees, bushes, flower beds, traditional for Kyiv region.

National Museum of Folk Architecture and Life in Pyrohovo

A fundamentally different approach was used in organizing the open-air exhibition in Pyrohovo, as the task was set to present not one region in more detail than in Pereiaslav, but equally to present all ethnographic areas of Ukraine. If we talk about the

Fig. 2. Six-winged windmill from the village of Liutenski Budyshcha in Poltava region (early twentieth century) [photo by Tetiana Kashchenko, 2021]

Fig. 3. Traditional autumn fair of folk crafts [photo by Wojciech Ciepłucha, 2021]

national specifics of the open-air landscape, it is impossible to fully embody the full authenticity of the regions in the territory, which ethnographically and climatically belongs to the Middle Dnipro region.

Therefore, despite the fact that the organizers tried to place the Carpathian objects on the hills, and the southern ones in the open space, the natural environment still remains typical of the Middle Dnipro region.

The National Museum of Folk Architecture and Life of Ukraine is a large architectural and landscape complex, which collects authentic wooden churches, wooden and brick houses and public buildings, farm buildings – piggeries, chicken coops, hives, and, of course, windmills from the ethnographic regions of Polissya, Slobozhanshchyna and Poltava region, Carpathians, Dnipro region, Podillia and South (Fig. 2). The museum was founded in 1969 on the southern outskirts of Kyiv, on the territory of the former lands belonged to the Kyiv-Pechersk Lavra. The museum opened for visitors in 1976.

The composition of the building combines ordinary buildings of houses, taverns, village councils, schools and dominants, which are served by several wooden churches and old windmills. There is free space in front of the dominant objects and they are perceived from afar, and the open space accentuates their dynamic silhouettes.

Today you can see about 300 monuments of folk architecture of the 16th – 19th centuries. The oldest exhibit is a house from the village Samary, Volyn region (1587), construction of a wooden church of St. Archangel Michael from the village of Dorohynka dates back to 1600.

More than 100,000 exhibits in the funds are samples of folk clothing of different regions and different times, fabrics, real ancient furniture, rural tools, potters, coopers, carpenters, joiners, blacksmiths, works of decorative and applied arts and ancient musical instruments.

Traditional Ukrainian trees grow around all the exhibits, flower beds are planted around houses and

Fig. 4. Flower beds around the church of St. Paraskeva from the village of Zarubyntsi [photo by W. Ciepłucha, 2021]

Fig. 5. Flower garden in the exposition of the Middle Dnipro region and open-air museum [photo by Anastasiia Akhaimova, 2021]

Fig. 6. Cosmos flowers near the church in the village of Dorohynka [photo by O. Homon, 2021]

Fig. 7. Petunias in the landscaping of the open-air museum in Pirohovo [photo by Tetiana Kashchenko, 2021]

Fig. 8. National motives in landscape design of a preschool educational institution of a nursery-kindergarten of complex type (sanatorium for weakened and often sick children) No. 43, Rivne, Ukraine [photo by O. Homon, 2021]

churches and guelder-rose (*viburnum*) bushes are planted. For the maximum folk color among the picturesque nature in the open space arrange celebrations of religious and folk holidays and traditional rites, seasonal fairs of folk products and crafts. In the creative workshop located in the building of the village administration, master classes on making various folk art products are held (Fig. 3).

The dominant feature of the entire open-air museum is the majestic three-part wooden church of St. Paraskeva from the village of Zarubyntsi, dated 1742, which the famous architectural historian P. Yurchenko called "the last giant of the Middle Dnipro region" (Fig. 4). The church is once an authentic type of multi-tiered tower church common in Ukraine.

This part of the open-air museum is planned in such a way as to recreate as much as possible the ancient Ukrainian rural traditions, when a square for community gatherings was arranged in front of the church estate. The church estate is surrounded by a fence with a gate. The church stands on a spacious section of the church estate. To maximize its disclosure on all sides, there are no tall trees that would cover the facades, but on the sides there are flower beds of traditional Ukrainian flowers (Fig. 5). Such long-loved plants in Ukraine were the so-called "roztripushky" (cosmos) (Fig. 6), marigolds (both *Tagetes* and *Calendula* genuses), mallows. *Cosmos* is a genus of herbaceous plants of the *Asteraceae* family. In Ukraine, the garden cosmos *(Cosmos bipinnatus)* with white, pink and crimson flowers is widespread, which has long been a favorite unpretentious plant of gardens and flower beds in the villages. This is a tall slender plant up to 1.5 meters tall, with a thin straight trunk, with openwork double-pinnate inflorescences in the form of a basket up to 7 cm in diameter, with white, pink and crimson petals. Pot marigold (*Calendula officinalis)* is an unpretentious annual plant with a height of up to 20 to 75 cm with simple light green leaves and yellow or orange flowers in the form of inflorescences-baskets with a diameter of 5–6 cm.

From ancient times the decoration of rural flower beds were medicinal plants. Thus, calendula helped heal wounds, were known bactericidal, anti-inflammatory, cholagogue, their infusion is treated and now sore throat and sore throat, gum disease.

Traditionally, this plant was used as a seasoning for dishes and as a side dish to first courses and salads. In the Middle Ages, soups were colored with marigolds.

It was believed that one look at the bright flowers lifts the mood and improves eyesight, girls who wove wreaths of marigold flowers and decorated themselves for birthdays, gives beauty. According to popular belief, if the marigolds opened flowers early in the morning, it meant good weather,

if the flowers opened late – wait for rain or thunderstorm.

The *Asteraceae* family also includes marigolds *(Tagetes)*, annual herbaceous plants in the form of dense bushes with flowers from yellow to brown. In Ukraine, they bloom from June to October, the flowers have a specific strong bitter aroma. Of the 59 known species of marigolds in Ukraine, three grow: Mexican marigold *(Tagetes erecta)*, the most common French marigolds *(Tagetes patula)*, and signet marigold *(Tagetes tenuifolia)*.

Roses and petunias were also common (Fig. 7).

Modern tendencies in landscape design of Ukraine based on national principles

When selecting the range of plants should strive to maximize the use of local flora, given its high viability. To enrich the landscape-planning composition, the local range of plants and trees can be expanded due to the variety of colors, changing at different times of the year, thus opening wide opportunities in creating a variety of color plantings and at the same time preserving the local flavor. Significant decorative value is also the time of emergence and fall of leaves of trees and shrubs. This property must be taken into account when selecting planting material. Skillfully choosing plants, you can extend the period of decorative effect of plantings.

The main background on which modern landscape compositions are created is the lawn. Versatile aesthetic and emotional impact on a person of grassy meadows became the basis for the appearance in urban gardens in ancient times of small areas sown with grass, the same traditions are successfully implemented in modern landscaping of preschool and educational institutions, where lawns are often installed small architectural forms and playgrounds in national forms (Fig. 8).

In many educational complexes it has become a tradition to plant national trees and flowers not only on the site, but also around the complex on the streets of the neighborhood, village, city. When developing landscape design, a comprehensive landscaping plan is developed, which includes all the necessary components: ornamental plants, conifers, flowers. An example of such a comprehensive plan for landscaping educational institutions with local trees and plants is shown in Table 1.

The experience of traditional landscape architecture, which is presented in the open-air museums of Ukraine, can be translated into the formation of landscape solutions for modern buildings of different types.

The design solution of the educational complex site should be based on the organization of the most favorable sanitary and microclimatic conditions conducive to quiet activities and recreation. Thus it is necessary to adhere strictly to functional purpose

TABLE 1

The recommended list of plantings and their characteristics [created by the authors]

The main ornamental plants		
#	Plants	Characteristic
1	Lilac *(Syringa)*	Flowering shrub. The color of the flowers is different. Height 1.5–3 m
2	Willow *(Salix L.)*	Shrub and fast growing tree
3	Birch *(Betula)*	The leaves are bright green in summer and yellow in autumn. Height over 20 m
4	Norway maple *(Acer platanoides)*	Leaves with a beautiful pattern. Height up to 30 m
5	Horse chestnut (*Aesculus hippocastanum)*	It blooms beautifully. Young trees are tied for the winter. Height over 20 m

Coniferous plants		
No	Plants	Characteristic
1	Baltic pine *(Pinus sylvestris)*	The needles are dull green. Height up to 20 m
2	European spruce *(Picea abies)*	The needles are dark green. Suitable for hedges. It is easily formed. Height 30 m
3	Northern white cedar (*Thuja occidentalis*)	The greens are brownish-green. It is easily formed. Height 6–10 m

Flowers					
#	Name	He-ight, *cm*	Flowering time	Flower color	Notes
1	Canna	60-120	August – September	Different colors	Seeds are scalded or sawn at planting
2	Peony	50-100	July	White, purple, pink	Winter hardy
3	Iris	15-100	May – June	Different colors	Іноді рекомен-дують вкривати на зиму
4	Chamo -mile	30-70	from May until frost	White, pink	Winter hardy
5	Tulip	30-70	Spring	Different colors	Winter hardy
6	Oriental poppy	40-100	June – July	Cinnabar red	Winter hardy
7	Corn-flower	30-60	June – July	Blue	Winter hardy

Curly plants. Annual herbal					
#	Name	Flower color	Flowering time	Characte-ristics of leaves	Notes
1	Ipomoea	Different colors	Summer	The leaves are dark green	The flowers open in the morning. Height 3-4 m

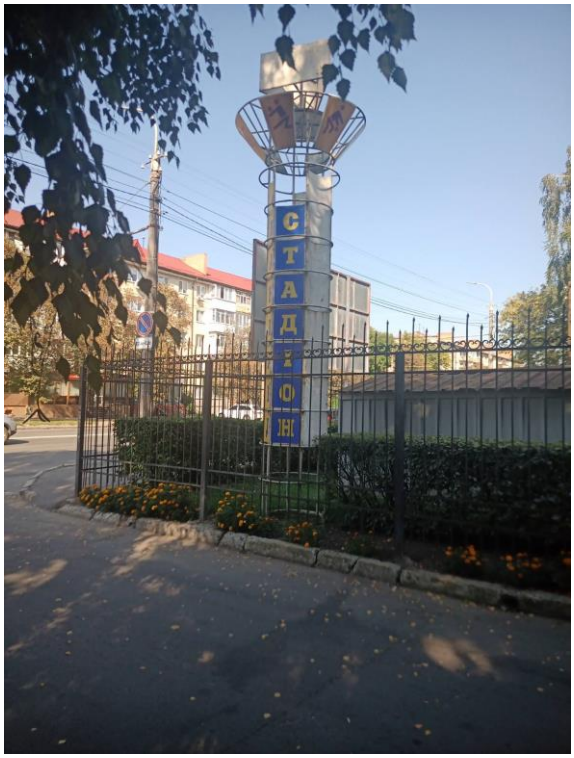

Fig. 9. Flower beds with marigolds around the stadium "Avangard" in Lutsk [photo by Anastasiia Akhaimova, 2021]

of separate gardening platforms, to select correctly plants on the basis of their landscape and decorative value and reality of the existing soil, climatic and other conditions.

An undeveloped aspect is the landscape modeling around large sports facilities in Ukraine, or rather it is almost absent.

Moreover, the issue of introducing a national style in landscaping of sports facilities is not on the agenda. This is due to a number of problems caused by the specifics of the operation of such facilities.

Problems of ensuring free evacuation, when a large number of people have to leave the building at the same time, when nothing should interfere with free evacuation. Flower beds and trees are an obstacle to safe evacuation. The only permissible is the delimiting function of flower beds.

Parking problems. The need to park a large number of cars near the stadium is the need for a large area of pavement, in addition, within walking distance of the structure.

The problem of relief microplastics is related to safety during slow or forced evacuation, when steps, unexpected terrain differences, reservoirs are prohibited.

In general, a utilitarian approach to the design of sports facilities dominates in Ukraine, however, addressing the topic of the article, there are the first attempts at authentic landscape modeling around large sports facilities. As an example, we can cite flower beds with marigolds around the stadium "Avangard" in Lutsk (Fig. 9).

Conclusion

The study of ways to solve the problem of preserving and reviving national identity in the context of accelerated globalization shows that this problem is increasingly being taken care of in many countries around the world, offering their own solutions. The authors explored classic examples of the harmonious combination of architecture and natural surroundings in order to maximize the features of national identity on the examples of Chinese and Japanese gardens, some traditions of which are implemented in modern parks, and the ancient gardens with pavilions have become tourist attractions.

This allowed the authors to focus on the relevant problem in Ukraine and identify effective ways to express national identity through the synthesis of natural landscape and folk architecture.

The best solution is to create separate thematic open-air museums with the transfer of authentic exhibits and their placement in the natural environment typical of Ukraine. Another option is to organize more chamber ethnographic corners with fewer buildings and a combination of old and new buildings in the historical style (complexes "Mamaieva Sloboda" in Kyiv and "Ukrainian Village" near Kyiv).

The authors explored two main ways of organizing thematic Ukrainian open-air museums: with a presentation of the genesis of folk-style traditions of one ethnographic region and with a more generalized presentation of all ethnographic regions of Ukraine. In the first case, it is possible to show in great detail the development of the traditions of a particular territory, but it is not possible to present the whole picture of the formation of the national identity of Ukraine. In the second case, a general picture of the development of Ukrainian traditions is created, but each region is presented in a more general way.

An important role in the creation of open-air museums is played by the natural environment, where traditional species of trees and shrubs are combined with flower beds of traditional flowers to create a complete impression. Traditional trees are oak, pine, spruce, hornbeam, linden, willow, aspen, ash, the most popular shrub – guelder-rose (*viburnum*), traditional flowers – marigolds, calendula, cosmea, mallow, petunias.

The problem is that in Ukraine only a national landscape concept is being formed.

The current trend reflects the desire for more active use of local plants inherent in local conditions.

The modern Ukrainian landscape concept is to correct the features of authentic nature, in particular, not to emphasize its authenticity, but to change, plant something different from the "native" – exotic flowers, unusual plant color, i.e. the desire

to create an exotic context around. At the same time, the Ukrainian landscape concept is a unique object of research and its comprehension and development is an actual architectural and creative task of the coming years. It includes the development of directions for the development of modern Ukrainian urban landscape culture, i.e. a combination of famous images and plants, global trends in this field with the simultaneous use of national techniques of landscape design. Thus, the optimal way is a dialectical combination of urbanism and the restoration of natural habitats of authentic nature.

The formation of landscape design solutions on the basis of sustainable development fully corresponds to the three basic aspects of this concept: environmental, economic, socio-cultural.

The ecological aspect of landscape design is the protection of natural resources and conservation of ecosystems, support for biodiversity. From the point of view of urban ecology for the formation of a harmonious natural architectural environment it is important to preserve or restore biotopes as part of new urban formations, residential and public complexes, their reconstruction, as was done in Potsdamer Platz in Berlin (Germany). At the urban level, the landscape component of urban areas has a significant impact on the microclimate, the quality of the urban environment: reduces wind and noise loads, regulates aerodynamic effects in buildings, prevents surface overheating, reduces the effect of heat island over cities, and promotes psychological and emotional comfort. Measures for microclimatization of territories by methods of landscape design contribute to improving the energy efficiency of buildings, which in general has an economic effect.

In the socio-cultural aspect, the purpose of such landscape design is to create a safe, healthy and comfortable environment, which is achieved by appropriate landscaping, arrangement of water and landscape objects, creating visual diversity (coloristics, composition), improving air quality.

Trends in the development of landscape design on the basis of sustainable development in the context of forming a holistic natural-architectural-subject environment are directly related to such ecologically oriented areas of architecture and design as: organic, bionic, bioclimatic, ecological architecture, sustainable architecture, green building, eco-tech, biourbanism, bioarchitecture, biomimetic, biophilic design, etc.

The relationship of the natural environment with the architectural-subjective artificial environment has variable links, which are formed under the influence of climatic, geographical factors, general and local characteristics of the environment, some of which will eventually become fixed as constant. Regional features of landscape design are formed under the influence of both objective natural-climatic and socio-cultural factors.

Through the synthetic understanding of natural landscapes and traditional methods of organizing landscapes, their colors and morphology, a semantic series is formed, which becomes the subject of cultural tradition in landscape architecture as a means of self-identification in society and environment, a means of expressing regional features of landscape architecture.

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Kopsavilkums. Rakstā tiek aktualizēts jautājums par arhitektūras un dabas vides mijiedarbību tautas nacionālās identitātes kontekstā. Pētījumā analizēti nacionālā kolorīta izteiksmes līdzekļi, detalizēti pētot nacionālās identitātes jautājumus Ukrainas teritorijā. Izvērtēta un izcelta brīvdabas muzeju loma, atspoguļotas nacionālās identitātes saglabāšanas pieejas un nozīme mūsdienu globalizācijas un starptautiskās arhitektūras apstākļos. Aprakstīta brīvdabas un etnogrāfisko muzeju, tautas motīvu fragmentāra izmantošana mūsdienu parkos.

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The role of the river, active landscape and greenery in the formation of urban development in Kyiv

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Abstract. The article analyzes the influence of the water artery – the Dnieper River and the active relief on the specifics of the city development on the example of Kyiv since ancient times. The specifics of the development of Kiev was that this development began from the territories close to the Dnieper, located on the right steep bank of the city. It is proved that initially the maximum use of proximity to the river and active Landforms was applied exclusively for religious dominants, whereas since the Soviet era, this vector has radically changed first towards representative ideological buildings, and in modern conditions – towards commercial multi-storey residential development. The purpose of the article was to trace how the waterway – the Dnieper River, accent landforms and landscaping influenced the formation of Kyiv during its existence, as well as to determine the features of the influence of these natural components on the modern development of the city. The scientific novelty of the study lies in a comprehensive coverage of the relationship between the natural components and development of Kyiv from ancient times to the present, identifying modern problems, their causes and ways to overcome them.

Keywords: waterways, active terrain, urban development, Kyiv

Introduction

The experience of studying historical cities shows that the location of the river was crucial for the formation of the urban planning structure. If the river "cut" two banks, then the "transition" of development occurred very slowly and, as a rule, much later than the appearance of the city development itself. There are quite many of such examples, it is worth remembering Krakow, where the most ancient buildings are concentrated on one bank, or Budapest, where the most ancient buildings are concentrated in the mountainous Buda part, and the buildings of the XIX-XXI centuries – in the lower Pest part.

From this point of view, Kyiv is no exception. A key role in the emergence of the city was played by its favorable strategic location. There are several versions about the origin of the settlement on the site of modern Kyiv, the most common are two – the Legend of the foundation of Kyiv settlements on several hills by three brothers Kyy, Shchek and Horyv and their sister Lybid, and the Legend of the installation of the Cross by the Holy Apostle Andrew on the Dnieper cliff in honor of the uprising here the glorious city in the future (on this legendary place St. Andrew's church was later built). Undoubtedly, the presence of a powerful waterway - the Dnieper River and high hills, which made it possible to build defensive fortifications of the settlement with the ability to view the long distance of the surrounding area, was the decisive factor in all cases. The availability of forests, which provided an additional opportunity to obtain natural resources, was an important factor. From chronicle sources we learn that a stream flowed along the modern Khreshchatyk in princely times, there were forests and predators around, as well as hunting grounds were areas near the modern church of the Savior-on-Berestov.

Therefore, the role and significance of the Dnieper River for the formation and development of Kyiv can hardly be overestimated. From the time of the first chronicle mentions, the city appears as an outpost on the banks of the river trade route (part of the direction "from the Vikings to the Greeks"). The trade and logistics function of the waterway probably became one of the main reasons for the development of the city and its acquisition of capital status. The natural hills and ravines formed by the steep right bank of the Dnieper also met the military needs of the time. In fact, Kyiv developed and positioned itself as a "city near the Dnieper", which played a significant role in shaping the image of the settlement.

Since the fact of the baptism of Kievan Rus by Prince Vladimir the Saint had not only religious, but also political significance, it was quite reasonable to place the most significant architectural objects (and they were cathedrals, monastery complexes and churches) on the edge of the high and steep Right Bank of the Dnieper, because it is known that the use of construction on or along with accent landforms, such as high banks, hills, cliffs enhance the imagery of an artificial object, that is, architecture.

The authors set the task to trace how the waterway – the Dnieper River, accent landforms and landscaping influenced the formation of Kyiv during its existence, as well as to determine the features of the influence of these natural components on the modern development of the city.

Materials and Methods

We analyzed relevant sources for this purpose.

The processed sources we grouped in the following areas:

General issues related to the protection of the cultural landscape and the "spirit of the place" – publications by Pujia L. [17], Sandu I.C.A., Spiridon P., Sandu I. [18], Spiridon P., Sandu I., Stratulat L. [20], Zilgalvis J. [28], Ivashko Yu., Kuzmenko T., Li S., Chang P. [7] – a review of these publications and the conclusions obtained by scientists allowed us to consider aspects of the development of Kyiv under the influence of the waterway and active landscape forms in a broader aspect;

Historical sources – works of Bulashev G.O. [1], de la Flise D. P. [3], Nechui-Levytskyi I. [12], Pavlutskyi H. [16], Shcherbakivskyi V. [19], Taranushenko S. [21], Vovk F. [24], Zakrevskii N. [26] – these publications expanded the horizons of the studied problems, allowed us to trace it in the general context of the development of culture, architecture and ethnographic features of Ukraine;

Architectural publications of contemporary scientists devoted to the architecture and urban development of Kyiv – publications of Erofalov-Pilipchak B. [5, 6], Kilesso S. [8 ,9], Markovskyi A. [11], Vecherskyi V. [22, 23], Zavada V. [27] – the works of these scientists allowed us to determine the range of little-studied issues;

Scientometric sources of Ukrainian scientists and their colleagues in recent years – monographs and articles by D. Chernyshev., Ivashko Yu., Kuśnierz-Krupa D., Dmytrenko A. [2], Leshchenko N., Tovbych V. [10], Orlenko, M. [13, 14], Orlenko M., Ivashko Yu., Kobylarczyk J., Kuśnierz-Krupa D. [15] – allowed us to consider these issues in the global, and not only in the regional context.

The research objectives determined the choice of scientific research methods. In particular, general scientific methods of historical analysis, comparative analysis, Urban Planning Analysis and the method of photo fixation were used, archival sources were also actively involved, in particular, the publications "Architecture of Soviet Ukraine" in 1938, "Socialist Kyiv" in 1934 and 1936, "Architecture of the USSR" in 1935, Government resolutions of these years. The method of historical analysis allowed us to analyze the specifics of the emergence and development of Kyiv, factors influencing its development, the method of comparative analysis allowed us to trace these changes in time and space and provide forecasts for the future.

Results and Discussion

In their publication Chernyshev D., Ivashko Yu., Kuśnierz-Krupa D., Dmytrenko A. [2] analyze in detail the role of the natural landscape in the perception of monuments of Ukrainian sacred architecture – both in wooden folk architecture and in the masonry architecture of the era called Ukrainian Baroque. Their conclusions allow us to include the temples of Kyiv, located on the edge of the right bank of the Dnieper, in their defined general methods of including water bodies, greenery and hills in the general ensemble of monasteries. The Kyiv Pechersk Lavra, St. Michael's Golden-Domed Monastery, Vydubetsky monastery, as well as other iconic monasteries of Ukraine during the Baroque period, had their own gardens, flowerbeds, vegetable gardens, hayfields, ponds with fish. Even today, the territories of the Lavra, St. Michael's Golden-Domed and Vydubetsky monasteries have a lot of greenery, fruit gardens and ornamental springs, flowerbeds. Thus, the traditions of landscaping of cult objects, which were laid in Ukraine in the Baroque era in both urban and suburban monasteries, some of which, like the monastery in Feofania eventually turned from a remote desert into a green monastery and urban structure and today is surrounded on all sides by elite residential complexes.

Since ancient times, the structure of Kyiv development has been divided into two functional components: the upper city and the lower city. The corresponding zoning was due to both a clear relief and a clear socio-utilitarian distribution: the upper city included a Prince's palace with a courtyard, an administrative and religious center and a settlement of the ruling elites; the lower city was a craft and trade center inhabited by representatives of the middle class and the poor. The corresponding distribution is reflected in the fundamentally different reflection and the Dnieper River. Let us start the analysis with the upper city, the historical core of Kyiv.

With the centralization of the state and the establishment of Christianity as a single religion, sacred images begin to stand out in the silhouette of the city. The national mythological field, accordingly, closely links the religious context to the Dnieper steeps: the story of the Apostle Andrew the First-called, who installed the first cross on the site of the future Kyiv, is canonized. This plot is closely intertwined with the fact of the baptism of the population in the Pochaina River (which after a while will be identified with the Dnieper in the appropriate context). So, starting from ancient times and especially from the moment of the baptism of Rus, the Kyiv Dnieper slopes are gradually sacralized, "grown over" with the silhouette of religious buildings dominating the city landscape. This clearly confirms the thesis that our ancestors knew about the accentuating role of the active landscape and waterways in emphasizing the architectural properties of the most iconic buildings and structures. If we analyze which sacred objects were placed on the upper edge of the Right Bank of

the Dnieper, these will be the most important shrines – the Assumption Kyiv-Pechersk Lavra, the St. Michael's Golden-Domed Monastery in honor of the heavenly patron of Kyiv – Archangel Michael, St. Andrew's Church in honor of the installation of the cross on this site by the Apostle Andrew. The Military St. Nicholas Cathedral and St. Basil's Three-Holy Church were destroyed in the 1930s and were not rebuilt.

From the middle of the XVIII century, with the strengthening of the power vertical and the final loss of Ukraine's independence within the Russian Empire, Kyiv became administratively an ordinary provincial city, but retained and, in a sense, to create a mythological field of "unity of East Slavic peoples under the auspices of Moscow king", strengthens its religious and historical significance. The main city-forming function of Kyiv is finally becoming religious and sacred: complexes of monasteries and churches are being actively developed, as well as the corresponding infrastructure for pilgrims. With the gradual leveling of the defensive significance of the urban fortification network, in the XIX century, parks were laid out on the viewpoints of the Dnieper slopes and gazebos were installed. The silhouette of Kyiv "along the Dnieper" is finally associated with the religious role of the city.

The trade and logistics function of the river is reflected in the structure of the lower city – Podil, which was formed along the low-lying coastal territory. The embankment was actually a commercial port, which until the middle of the twentieth century inclusive was developed with warehouse and engineering structures. In Podil, according to the urban planning of the XVI-XIX centuries, the key core was the current Kontraktova (fair) square with the town hall and trade rows; a number of churches and the Mohyla Academy, which were located at some distance from the edge of the river were dominant.

In fact, the Podil embankment was used only as a port harbor with warehouses, completely excluding the possibility of positioning the latter as a representative recreational area. This was due not only to the socio-functional distribution, but also to the clay-sand riverbank, which is difficult for engineering development, and the annual flooding due to spring floods. After the development of the railway network, the commercial function of the river port significantly decreased, the business center of Kiev shifted to the upper city.

So, as of the beginning of the twentieth century, the Dnieper bank in Kyiv had two independent figurative and symbolic components: on the one hand, the sacralized silhouette of the upper city, with religious buildings dominating the urban landscape, the first park areas, viewpoints, etc., on the other hand – a utilitarian commercial port with warehouses of the lower city.

Starting from the end of the XIX century, the situation begins to change dynamically – the increasing rate of urbanization and rising land prices force developers to pay attention to previously unsuitable territories that can be developed due to the achievements of the engineering and construction industry during the Industrial Revolution. At the same time, with the strengthening of the role of the bourgeoisie, the conditional socio-class division between the upper and lower cities is leveled. Industrialization also makes Podil attractive to investors.

After the completion of the construction of the Mikhailivsky electric cable car [funicular] in 1905, according to the project of M. K. Pyatnitsky and M. I. Baryshnikov, the question arose about the improvement of the Poshtova square, proposals were put forward for laying tunnels of the city railway [metro] from the port to the station, which, however, were rejected by the city administration. However, the renovation of the Square was not carried out in full due to the First World War and subsequent revolutionary events.

After the national liberation struggle and the communist revolutionary upheavals of the first decades of the twentieth century, the urban planning situation in general and the use of the Dnieper embankment in particular became very uncertain. The old concept of building and development did not suit the new Soviet government in principle due to the urban-planning dominance of religious buildings; there were no resources to develop a new one due to the transfer of the administrative capital to Kharkiv.

The 1920s were marked by the lack of a clear plan for the development of Kyiv: the city was rebuilt mainly due to increased industrialization and an increase in the share of industrial enterprises. The main city-forming emphasis of Kyiv was being changed from a religious, sacred and business center to an industrial hub. The cargo harbor in Podil is being developed. Author of the General Plan of Kyiv of 1935, P. P. Khaustov noted that the urban industry was in its "rudimentary" state until 1917 and was mainly artisanal and semi-artisanal in nature. There were less than 15 thousand workers in the city with a population of half a million.

In the article "The experience of urban planning in Ukraine" from March 1938, engineer V. Novikov points to the sharply unsatisfactory state of urban planning in the USSR. In particular, there is a tendency to lack a single Urban Development Plan as the main document for the development of settlements; violation of established borders by individual developers, free placement of industrial facilities in conflict with the general plan; overloaded bureaucratic apparatus and lack of interaction between departments that could conduct their own independent construction policy.

All the above-mentioned problems were fully characteristic of the development of Kyiv before 1934 (and sometimes long after), when, with the return of the capital's status, the structured development of the master plan begins. The city's architects come to the conclusion that it is necessary to create a fundamentally new document that would allow to regulate construction, group industrial enterprises on the principle of zoning and include in circulation promising areas not previously used due to sanitary (lowland, wetlands), geological (difficult soils) or financial (increase in the cost of construction on the terrain) factors.

In the master plan developed in 1934-1935, a further course was planned for the industrialization of the city, while simultaneously rebuilding it in accordance with the restored capital status. The main vectors of development of this master plan, which was finally approved in 1938, stating the first achievements in its implementation, gives the author, architect P. P. Khaustov, in his article "Construction of 1938 and planning of Kyiv": "It is safe to say that 1938 will be a very important stage for the construction of Kyiv, a stage in the implementation of its general reconstruction project. A number of important technical measures will be taken in this direction. At the same time, the city will be enriched with new houses, magnificent monuments, picturesque massifs and greenery. Kiev should become and will become the Model capital of the flourishing Ukrainian SSR."

In the context of the issue of the role of the Dnieper and its embankment, the new master plan "turns Kyiv facing a river" – embankment should become a new recreation area and facade of the city. According to the plan, in particular:

Work is underway to strengthen and improve the right bank. A retaining wall is erected and lined with granite; the embankment and the Embankment Highway are raised, which is assigned a strategic role. One of the important objects of construction of the capital is the Dnieper embankment, which upon completion will not only improve the connection with the new left-bank district of Kyiv, but will also be an essential element of the architectural design of the right bank. The embankment is being built with a number of descents to the water and is a complex technical structure, due to the landslide nature of the area;

A comprehensive project of landscape viewpoints and alleys, parks, sometimes with partial demolition of buildings, is being developed to "reveal the view of the river";

For the first time, a plan for the development of Kyiv is being adopted with the involvement of territories on the left bank (although, formally, the Left-Bank district was included in Kyiv before that, but it did not have a well-maintained integral development). The project specifies plans for the construction of a new Harbor on the site of modern Rusanivka with the development of The Venetian Island (Hydropark) and the transformation of Trukhaniv and Dolobetsky islands into a park (possibly with a partial artificial change of the channel);

Disclosure in the project of the new government quarter, which should become the administrative and political center of Kyiv, to the river, with the removal of the silhouette of the complex on the Dnieper slopes and the main staircase to the embankment.

Researcher B. L. Eerofalov-Pilipchak notes the ambition of the tasks set, which were significantly ahead of their time and, in our opinion, the real engineering, technical and financial capabilities of the city in the 1930s. "Master plans are good because the city authorities think that they know what and where to build <…> Master plans are bad because, as a rule, they are implemented to a small extent…" [6, p.71].

The directives of the leadership of the Communist Party of Ukraine, primarily P. P. Postyshev, set the task for architects of radically changing the role and function of Kyiv in a short period. The above-mentioned Government Quarter, together with the buildings of the Council of People's Commissars by I. O. Fomin and Verkhovna Rada by V. G. Zabolotny, were the key core of the global plan for the reconstruction of the city. In the light of those events, this was presented not so much as a purely architectural task, but became a programmatic, symbolic and almost sacred thing: "an opportunity to turn the former city of churches and monasteries into an architecturally complete, truly socialist center of Soviet Ukraine."

After the preliminary design work, the Kyiv Architectural and Planning Department proposed 6 basic town-planning offers for the location of the quarter (according to the article by architect Molokin, only 5 were considered). A variant of the Proletarian (Pioneer) Garden by arch. V.G. Zabolotny and his team opened Khreshchatyk to the Dnieper. The promising, as will be noted later, decision was not fully appreciated by contemporaries. The government commission noted that this option will lead to the loss of scenery landscapes and the square will not have enough space for holding solemn parades.

The Contest Commission selected a plot on the place of the Mykhailivsky Golden-Domed Monastery, Vasylkivska (Three-Holy) Church, the Square of the Red Heroes of Perekop (now Sophia Square) and the Government Offices. The area was supposed to be 130 meters wide and more than 600 meters long. It was planned to allocate more than 10 million rubles for the construction of the structures of the Council of People's Comissars and the Central Committee of the CP (B) U,

the buildings were to be grouped around a large square for holding solemn parades and demonstrations. A prerequisite was the erection of a monument to Lenin on the edge of the slope, which, together with the administrative buildings, was to create a coherent image and a silhouette line.

The Dnieper slopes in this new vision were assigned, in fact, the usual sacred and symbolic role. Only religious dominants were to be replaced by monuments to the new regime with its symbols, philosophy, and, at the time of the mid-1930s, neoclassical super-scale aesthetics. When developing the competition task for the main construction of the Ukrainian SSR (Government quarter), the need for a silhouette solution of government buildings and the Lenin monument between them was separately noted: "the Square should dominate the city with the opening of the ensemble to the Dnieper, with the identification of its unique topography." The funicular, according to the proposals submitted for the competition, was to be replaced by a majestic Grand Staircase that would descend to the current Poshtova Square.

Due to a number of political and economic factors, the project of the Government quarter was not fully implemented, leaving a separate structure of the Council of People's Commissars of architect Langbard, taken out of context, opposite the wasteland on the site of the demolished St. Michael's Golden-Domed Monastery.

The next stage in the transformation of the Dnieper slopes into a symbol of the socialist city could be the reconstruction of Khreshchatyk after World War II. Through the entire first round of the competition for the restoration of the central street of the city, announced in 1944, the red line is the idea of opening Khreshchatyk to the Dnieper. Most of the contestants suggest continuing the visual range of the street, leveling the hill at its end and opening up a promising view. Contemporary of the competition, architect M. P. Bilinkin, in his article devoted to the competition, emphasizes several times: "the final exit of Khreshchatyk to the Dnieper, "to nature", the possibility of human transition from the architecture of the city to the infinity of the Dnieper expanses of the left bank is understood as one of the most important elements of the entire composition." The proletarian version of the Government quarter almost completely coincided geographically with the new competition and partially outstripped its achievements.

Within the framework of the competition from 1944, the proposal of K. S. Alabyan is interesting. He sets the arch at the end of the street, at its opening in the middle of Stalin Square, against the backdrop of the Dnieper. Bilinkin is critical of this concept, noting that the author "puts an arch at the exit, wanting to fit nature into the framework of architecture"; meanwhile, maintaining the urban planning composition itself, expanding Khreshchatyk at the end, absorbing the final Square. We, as researchers, cannot agree with the relevant city-forming decision, noting that the arch itself, installed along the axis of Khreshchatyk and perpendicular to one of the oldest traditional directions of movement from Volodymyrska Hill to the Lavra (a popular pilgrimage procession before the October revolution), breaks historical transport and visual ties. The idea of installing an arch at the end of Khreshchatyk will be implemented later, under completely different circumstances and with a different thesaurus. Meanwhile, the Arch of Friendship of Peoples, made in the style of modernism, will be shifted to the crest of the Dnieper slopes and will not be connected directly to the axis of the street.

In our opinion, the continuation of the central street through the Dnieper slopes would come into conflict with both the landscape of Kyiv and the historical image of Khreshchatyk itself. Revealing the composition by shifting the hill seems like a bold and interesting idea, but it deprives the street of a certain completeness. The transition point from Volodymyrska Hill to the Pechersk hills, which become separated by the highway axis, also disappears. The natural amphitheater of the European Square (then Stalin Square) disappears, turning Khreshchatyk into a kind of ray.

The surviving house of the former Merchants' Assembly (which, however, was in a state of emergency) is being demolished. Yerofalov-Pilipchak sharply criticizes this disclosure in his book "Architecture of Soviet Kyiv". The idea is leveled in the next rounds of the competition, eventually leaving Stalin Square almost unchanged.

In the second half of the twentieth century, significant changes also took place in the lower city: the cargo function of the river port is rapidly being leveled due to an increase in rail and road transportation. As Kyiv develops, the industry is gradually being moved from part of Podil, opening up the possibility of creating walking and recreational areas. An exclusively passenger river port is being built on Poshtova Square, and a pedestrian bridge to Trukhaniv Island beach is being built nearby. The Podil embankment is gradually but tirelessly being transformed.

In the post-war period, especially after 1955, rapid development of the left bank continues: new bridges, a metro line are being laid, and residential development is multiplying. In numerous urban development projects created in the 60s and 70s, designers propose moving part of the administrative and socio-cultural development to the left bank (mainly in the area of the modern Livoberezhna metro station and the unfinished Rusanivska station on the river edge). In particular, the theater, post office and Tourist hotel near Livoberezhna station serve as a partial implementation of the ideas.

STAGES OF THE KYIV CITY SILHOUETTE FORMATION ON A GREEN HILLS OF DNIPRO RIVER

a) The initial view of the hills

b) Pre-revolutionary stage (before the 1920s)

c) Projects and redevelopment of the mid-1930s

d) Post-war period (mid 1950s - late 1980s)

e) The first years of independence (1990s-2000s)

f) Actual view and future tendencies

Accordingly, these projects actively include the Dnieper in the network of public and recreational areas of Kiev, finishing embankments, offering projects of pedestrian overpasses from the Poshtova Square to new centers across the islands, etc. Unfortunately, promising projects, according to the authors of the article, were not fully implemented for a number of reasons (for which we can separately highlight the lack of desire of the city administration to move from the historical center). Meanwhile, these concepts show the dominant trends of architectural thought in the second half of the twentieth century and provide valuable material for developing future master plans in Kyiv.

In the last years of the Soviet Union's existence, the edge of the right bank of the Dnieper was decorated with a high-ranking ideological dominant – a sculpture of the Motherland with a sword and a shield with the coat of arms of the Soviet Union. The sculpture with a pedestal has a height of 102 meters and is part of the memorial complex in honor of the victory of the Soviet people in the Second World War (Great Patriotic War according to the Soviet paradigm).

Ukraine's independence increased the role of Kyiv as the capital of an independent state, respectively activating urban processes. Since the 2000s, and especially during the last decade, there has been emergence to the upper edge of the right bank of the Dnieper, no longer cult, but elite residential buildings, the appearance of which has caused discussion in society. In addition, the Great Bell Tower of the Lavra is no longer the tallest building in Kyiv, which until 1917 pilgrims saw from afar, approaching the city. The change in the vector means that economic factors, not religious ones, have become dominant, so commercial skyscrapers are actively growing around the Kyiv Pechersk Lavra, which changes the silhouette of Kyiv on the right bank of the Dnieper. However, these modern high-rise buildings still stand mostly not on the very edge, but on the second line, in the distance.

There is a need to preserve the green slopes of the right bank of the Dnieper. Part of them is the park around the iconic place – Askold's Grave. According to legend, in 882 the Varangian prince Oleg insidiously killed the then rulers of Kyiv, princes Askold and Dir, in order to seize power in the city. According to the same legend, Askold was buried at the place of his death, in a tract called Hungarian. A small wooden church was later built over the burial site, since Askold was a Christian. In 1810, a brick classical rotunda church was built on the site of a wooden church designed by the famous Kyiv architect Andriy Melensky, around which an aristocratic cemetery appeared. This place was immortalized in watercolors by the famous Ukrainian poet and artist T. Shevchenko. After 1935, the cemetery was destroyed, and the area around Askold's Grave became part of the city park. In Soviet times, the church was turned into a pavilion, where a sculpture of Nestor the Chronicler was displayed. During the independence period, the temple was restored to its original purpose.

From ancient times, Volodymyrska Hill, which until the middle of the 19th century was called Mykhailivska Hill in honor of the Mykhailivsky Golden-Domed Monastery located there, was a unique place with impressive prospects. In the 1830-40s, the hill was rebuilt, landscaped with paved paths, planted greenery and turned into a city park, which it remains to this day. Volodymyrska Hill is of great ideological importance, because a 4.5 m high on a 16-meter cast iron pedestal monument to the Baptist of Russia, Prince Vladimir, was erected there in 1853. The total height of the monument is more than 20 m. There are gazebos, benches, small architectural forms on the territory of Volodymyrska Hill, every year a procession to the temple holiday takes place to the monument to Prince Volodymyr.

Conclusion

After Ukraine has gained independence in 1991, Kyiv became the capital of the state, which accordingly leads to an increase in the number of self-governing administrative departments in need of placement. At the same time, the increasing pace of urbanization, together with a significant increase in the number of private transport in a market economy, lead to a significant aggravation of logistics issues in the central part of the city. These two factors with renewed vigor raise the issue of forming a new administrative and managerial Center necessarily outside the historical central part.

Market conditions lead to the closure or transfer of part of industrial production outside or to the periphery of Kyiv, revealing promising areas for placing the future Center. The first of these sites was considered the Rybalsky Peninsula, the reconstruction project of which was called "Kyiv City" (2005-2019) by analogy with the corresponding projects in other mega-cities of the world.

One of the authors took part in a competition for administrative centers on the Rybalsky Peninsula and a Government Center on Telychka, but these projects were suspended due to the crisis.

For some time there was a concept of building a similar Center on Osokorky, however, after the beginning of multi-storey mass residential development, most architects consider as the "last perspective" the historical area of Telychka on the right bank, between two bridges. A number of projects that have been proposed and are being proposed on this site include administrative, cultural and residential development in different proportions. In general, the concept of functional division of territory can be compared with "Kyiv-City".

Each of the three sites is chosen near the Dnieper, actively reflecting on the river and seeing in it the main recreational area, a panorama view and symbolic imagery.

From a trade highway, the Dnieper is finally turning into the main recreational and representative attraction of Kyiv. Having emerged as a city "by the river", Kyiv, in the process of development, having developed on both banks, included water spaces in the middle of the urban ensemble. In fact, the symbolic sacredness of the silhouette of the right bank remains unchanged until recently, which, however, is under threat of thoughtless development in the new socio-economic realities. In the framework of this article, we have studied the gradual transformation of the role of the Dnieper, the shift of emphasis depending on specific historically determined socio-economic factors. We can deduce a direct relationship between the attention of architects to the key waterway of the city and the change of the dominant urban function and the corresponding orientation of the urban framework, the location of the central core. The Dnieper River has a huge potential for further development, improvement

and use of coastal territories and islands in accordance with the development prospects of Kyiv and the surrounding agglomeration. We hope that our research and analysis will allow urban planners in many countries who have similar problems with the waterway in the city, especially along the Dnieper River, to find a solution to this problem. The authors consider the preservation and harmonious use of landscapes to be the priority in this process.

The study of scientific sources and a number of archival documents and publications of the 1930s allowed us to identify a number of issues that require more in-depth research. In particular, it is necessary to trace the specifics of changes in the urban vector of development of Kyiv from the 1930s to the present, to determine the main problems of modern development of the city and the reasons for their appearance.

Urbanization processes have further exacerbated the crisis phenomena, including those caused by the pandemic, when people in search of jobs were drawn from small towns and villages to the capital. Accordingly, we can say that this has caused a modern "construction boom", but rather one-sidedly: high-rise housing and offices are being built in prestigious and attractive areas, but no work is being carried out to expand roads, install parking lots, primary service institutions, new schools and kindergartens. Even now, the city is constantly suffocating in traffic jams, which has led to the transition of a significant part of the population to ecological modes of transport – bicycles, longboards, and electric scooters. Development is also coming to the old park and forest areas of Golosieve, Feofaniya, Kadetsky Gai. Sealing of buildings with deep foundations blocks the channels of underground streams, due to which they dry up and cease to feed the green areas.

An even bigger problem is the deterioration of the environmental situation in the city, caused by the uncontrolled growth of the urban population, respectively, the number of new buildings and transport, and the reduction of green spaces within the city, which causes constant clashes between residents and developers. Environmental problems are exacerbated by the greenhouse effect and climate change, when due to the abnormal heat in Kyiv, the Dnieper melts, overgrown with duckweed, fish die in it, bacteria multiply, which makes it dangerous to swim in the Dnieper.

The way out of this situation can be control over the growth and development of the territory of the capital, a clear definition of historical areas with restrictions or prohibitions of new high-rise development, ordering the territories of urban recreation – Hydropark, Trukhaniv island, slopes of the right bank of the Dnieper, arranging new and landscaping old park areas on the territory of the city, taking into account the modern recreation needs of citizens. A separate issue is the cleaning of the Dnieper riverbed, the elimination of uncontrolled emissions of chemicals from industrial enterprises into the tributaries of the Dnieper.

Over the past 10-15 years, as part of the development of the new Master Plan of Kyiv, questions and relevant competitions have been raised (in which the authors of the article constantly take part) regarding the preservation of unique Kyiv landscapes, which are protected by a separate law. Constructive struggle in the protection of historical landscapes, including the landscape of riverine territories, is accepted as the founders and members of the public organization "Kyiv landscape initiative" by the authors of this publication. The main problem is how to ensure free access of the city to the Dnieper. At present, an intensive transport corridor runs along the right edge of the Dnieper - the Dnieper Highway, which cuts off the Dnieper from the city.

One of the proposals is to "hide" the highway in a closed gallery with the possibility of installing on its roof a pedestrian zone with access to water.

The authors of the publication are supporters of moving the transport corridor to the left bank of the Dnieper. This will provide free single-level access from the city to the Dnieper with a full-fledged recreational area of the park, in which the means of landscape urbanism emphasize all the opportunities and advantages of the city near the river, although this option is more expensive and complex.

It is necessary to build additional bridges and transport interchanges from the left bank to the right, as this may solve a number of problems. Another aspect is that for thousands of years the slopes of the right bank of the Dnieper have been eroded. The authors of the presented study conducted a simulation of this process over time and the results of their study proved that in some places the Dnieper riverbed changed from 200 to 500 meters. Thus, the transfer of transit highways from the right bank to the left allows to restore in some places the changed natural landscapes of the right bank and to provide coastal protection measures by means of riparian landscape urbanism.

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Kopsavilkums. Rakstā analizēta Dņepras upe un reljefa ietekme uz Kijevas pilsētu. Raksta mērķis izvērtēt kā ūdensceļš – Dņepras upe ar reljefu formām un ainavtelpu ietekmējusi Kijevas veidošanos no seniem laikiem līdz mūsdienām. Pētījumā identificētas un pētītas mūsdienu problēmas, izvērtēti dažādi cēloņi un veidi, kas ietekmē Kijevas ainavu.

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Landscape component of permaculture as a way to create video-ecological socially-oriented architecture (on the example of Chernivtsi region, Ukraine)

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Abstract. The article analyzes and investigates the economic problems of urban and rural populations, ecological and emotional-psychological effects on people of urbanized visually "polluted" environment; considers the terms "permaculture" and "video-ecology"; different types of natural landscapes. Methods of greening the urban environment using the principles of permaculture and the possibility of their application in creating a comfortable architectural environment are studied. The aim of the study is to analyze the landscape component of permaculture as a way to create video-ecological architecture (on the example of Chernivtsi region). The basis of the philosophy of permaculture is a competent functional design of interconnected components from which a system is built, namely, in our case – a socially-oriented architecture, which involves the design of an architectural environment focused on addressing the social needs of society. Describes ways to create a video-ecological innovation center of employment with public spaces with the study and consideration of the permaculture method of areas for landscaping, as well as designing a complex and creating public spaces according to different types of landscape areas of Chernivtsi region in Ukraine.

Keywords: permaculture, video-ecology, socially-oriented architecture, innovative employment centers, public spaces, landscape, Chernivtsi region, Ukraine

Introduction

Trends in global processes of urbanization of the architectural environment lead to more frequent signs of global environmental crisis, which manifests itself in negative effects on the physical and psycho-emotional state of a person, with such manifestations as stress, depression, chronic fatigue, increased cardiovascular disease and more. Cities "suffer" from the lack of greenery, polluted air, water, increased noise and radiation, similar houses, oversaturation of advertising, monotonous asphalt and concrete surfaces, lack of places to rest and other factors create "pollution" of the visible environment. In this visually "polluted" urban environment, which is in conflict with the natural environment, is the destruction of "mental matrix" of a person, the number of negative emotions and aggressive action increases. And in a recent quarantine restrictions especially valuable were preserved natural landscapes that provide comfortable living environment.

It is well known that natural landscapes in the original version of the best preserved in the villages, which characterized by typical development of separate small buildings and employment in the sectors of agriculture. However, recent trends show that a significant number of villages in Ukraine are "dying out". During the period of independence of our state, about 500 villages disappeared from the administrative map of Ukraine [23]. There is a mass migration of the rural population to the cities, due to low incomes, lack of infrastructure, medical care, quality education and transport links.

Urban landscapes provide for the preservation of areas with natural vegetation, a combination of artificial and natural environment. The natural environment itself is formed over a long period of time and is determined by the development of the original structure of the landscape and greenery systems. Urban areas are more developed, but we can often find degraded former industrial buildings that create an unfavorable, disharmonious architectural environment. Comfort and impact on the psycho-emotional state of a person of the urban environment is determined by the visual perception of its space and is provided by the interaction of biotic (plants, animals) and abiotic (atmosphere, hydrosphere, lithosphere) landscape components with artificial anthropogenic environment. Due to the negative socio-economic processes taking place in the country, as well as the coronavirus pandemic, a large number of small businesses were closed and a significant number of employees were laid off. Negative phenomena such as declining incomes and rising unemployment can be observed in many cities of our country.

Given these processes, it is important to restore urban and rural areas through architectural means, including the design of socially-oriented

architecture, which will provide opportunities for quality economic, psycho-emotional life of various categories of the population. It is also important to organize close cooperation between the city and the village, which can complement and develop each other.

The urgency of this problem is confirmed by a significant number of modern scientific studies. In order to use existing world experience to solve the problems, the authors have studied scientific sources from scientometric databases that raise the issue of environmental protection: articles by Leshchenko N., Tovbych V. [14], Grazuleviciute-Vileniske I., Seduikyte L., Daugelaite A., Rudokas K. [5], Chernyshev D. Ivashko Yu., Chang P., Kuśnierz-Krupa D., Kuzmenko T., Li S., Zueva P., Ding Y., Dmytrenko A. [2, 7, 8, 9, 10, 18, 25], Veinberga M., Skujane D., Rivza P. [22], Deveikien V. [3], which consider aspects of the urban landscape and the role of the natural component in the structure of the city, various aspects of the use of the natural environment, including as recreation and means of tourism. Publications are directly related to the research topic: Bachynska L., Kozlova N. [1, 12], Vasylykha I. [21], Volkova O. [24], Hutsul T. [6], Kolosok B. [11], Mollison B. [16], Nekhuzhenko N., Galimov A. [17], Parfenova I., Marenchuk O. [19], Tovbych V., Mykhalchenko S. [20].

The important role of landscaping, ponds, diversity of relief in creating a human-friendly environment is emphasized in the publications of Nekhuzhenko N. and Galimov A., who in the article "Landscape components as a factor of the emotional perception of the urban environment" note that vegetation, various landforms and water bodies are not only natural components, but also a "mental matrix" - a harmonious natural environment that is emotionally supports the person [17].

Legislative study of the relationship between urban and rural areas in Latvia was carried out by Markova M. in a scientific article «Rural-urban Interaction Inclusion in Ongoing Latvia Regional Reform» [15].

A special term "video-ecology" has been introduced in scientific sources. The scientific direction of video-ecology was first initiated by Filin V., who considered the visible environment from the point of view of ecology and showed that the visual environment is the same ecological factor as water, air, noise or radiation [1; 4]. Researchers distinguish two types of visual fields in the architectural environment that create a negative impact on humans: aggressive and homogeneous fields. Aggressive visual fields contain a large number of uniform elements of the same type, and homogeneous - monotonous "naked" surfaces that do not provide a person with any information. Instead, the optimal visual field provides a sufficient amount of information to the "optic nerve", providing a diverse architectural environment, using compositional methods (color, architecture, facade detailing, etc.) [4].

One of the ways to create video-ecological architecture is permaculture - philosophical methods of architectural and landscape organization of natural ecosystems. Originated in the middle of the last century, permaculture has developed widely in the world and combines many industries, including ecological, regenerative design, ecological engineering and construction, landscape design, organic agriculture and more. The founders of permaculture are Bill Mollinson, David Holmgren, Sepp Holzer, Masanobu Fukuoka, who with some differences formulated the principles of permaculture, but common to all was a harmonious existence with nature [16].

Parfenova I. and Marenchuk O. in his article "Permaculture as a way of organizing the landscape of ecotourism objects" notes that permaculture can be considered as a way of life in harmony with nature, when man-made and modified landscapes copy natural systems and connections. The authors distinguish the following methods of permaculture: method of zones, method of sectors, method of taking into account slopes, method of taking into account orientation, method of functional analysis, method of random arrangement, method of exceptions, method of superimposing data based on repetition of nature [19].

Volkova O. in the article "The role of permaculture in the greening of the urban environment" argues that permaculture is the direction of greening the urban environment, which is to use areas, surfaces of buildings and structures for growing plants and thus improve the environment. Landscapes are designed to replicate natural systems and connections, and provide food, materials and energy to the local population [24].

The organization of the landscape and architectural environment using a permaculture approach is becoming more widespread every year in agriculture, the creation of ecological infrastructure in cities (eco-settlements), the formation of public and recreational spaces, etc.

The object of research is permaculture as a way of organizing video-ecological socially-oriented architecture. The subject of the research is the peculiarities of using the landscape component of permaculture as a way of organizing video-ecological socially-oriented architecture on the example of Chernivtsi region, Ukraine.

The aim of the study is to analyze the landscape component of permaculture as a way to create a video-ecological architecture (on the example of Chernivtsi region).

Materials and Methods

The general research methodology includes the following methods:

- study and analysis of cartographic, statistical, design and research materials: field surveys, observations and comparisons – to solve the problem of isolating the study area (region, district);
- structural-logical analysis, mathematical analysis, spatial analysis – to outline the means of influence – video-ecology and permatuculture;
- geographical systematization, graph-analytical analysis, compositional analysis with the subsequent expert assessment – for the analysis of town-planning structure of object of research;
- methods of modeling and forecasting erosion and degradation of natural landscapes;
- method of experimental design and special methods of assessment of recreational potential of territories.

The study used a systematic approach to the comprehensive study of large and complex objects and systems as a whole and to study the features of the functioning of all its elements.

Research of the existing domestic and foreign source base and experimental research conducted by the authors allowed to determine the range of unexplored issues:

- in modern Ukrainian society the possibilities of permaculture and video-ecological architecture are insufficiently used, while in the world these directions have found wide application, especially taking into account ecological tendencies in the society;
- the landscape of Chernivtsi region needs to be studied from the point of view of a specific component of permaculture.

Results and Discussion

Landscape features of Chernivtsi region

Chernivtsi region is located in the southwestern part of Ukraine and borders Romania in the south and Moldova in the southeast. In the west and northwest – with Ivano-Frankivsk, in the north – with Ternopil and Khmelnytsky, and in the east with Vinnytsia regions. This is the smallest region of Ukraine.

In Chernivtsi region, the following three groups of natural areas (landscapes) can be distinguished (Fig. 1): a) forest-steppe landscapes of the Prut-Dniester interfluve; b) forested hilly landscapes of the Prut-Siretsky (Bukovinian) Precarpathians; c) mountain forest landscapes of the Bukovinian Carpathians.

Natural areas (landscapes) differ from each other not only in morphological structure, but also in climate, connection of soils and vegetation, the predominance of certain natural processes (erosion, waterlogging, drought, floods, etc.) and, finally, the peculiarities of economic use and environmental problems. All this is necessary to know in order to plan the development of industry, agriculture, transport, the creation of socially-oriented architecture, etc., to take into account the individual features of natural areas and create differentiated by natural and administrative areas, measures for their rational location and use, bearing in mind the task of nature protection and rational use of its resources.

The Prut-Dniester interfluve (Fig. 2) is divided into seven natural areas:

Zastavnivsky karst steppe region occupies a watershed position with absolute heights of about 300 m (fluctuations from 240 to 300 m), which creates a calm undulating relief.

Pryprutsky terrace forest-steppe area lies to the south of Zastavnivsky natural area and extends only to the terraces and floodplains of the Prut River. The border between these natural areas can be drawn approximately along the line of the villages Malyatyntsi – Klivodyn – Maly Kuchuriv; the southern border of the district – along the Prut. The landscape areas of the Pryprutsky terrace area are fully developed: most of them are used as arable land, some – as hayfields and pastures (on the lower terraces) and quite a large part is used for villages, roads, gardens, orchards, etc.

Khotyn hilly forest area corresponds to Khotyn upland, which stretched from Chernivtsi to Khotyn. This is one of the highest natural areas on the Prut-Dniester interfluve (average altitudes 350-400 m, maximum (Mt. Berda) – 515 m). Most of the Khotyn Upland belongs to the Khotyn district, and the rest to the suburban zone of Chernivtsi and Zastavnivsky district. This forest area is of great environmental and recreational importance. Picturesque landscapes, the proximity of the Dniester with its deep valley and Chernivtsi indicate the feasibility of organizing a natural park for recreation, preservation of valuable natural landscapes.

Novoselytsia terrace steppe basin is located south of Khotyn Upland, it extends to the entire series of terraces of the Prut, which are quite wide (from 2 km in the west, near Chernivtsi, to 10 km on the meridian of Novoselytsia).

Dolynyano-Balkovetsky district is located in the upper reaches of the tributaries of the Prut (villages Ringach, Cherlena, Stalnivka and Potik). This natural area includes the villages of the southern part of Khotyn district (Sankivtsi, Kerstentsi, Stavchany, Dolynyany, Dankivtsi, Pashkivtsi, Bilivtsi, Yarivka and some others) and the northern part of Novoselytsia district (the villages of Ringach, Dynivtsi, Malynivtsi, Forosna, Balkivtsi, Cherlenivka, Nesvoya, etc.).

Kelmenetsky steppe district occupies a lower part of the Prut-Dniester watershed with absolute heights of about 220–230 m and only in the strip of

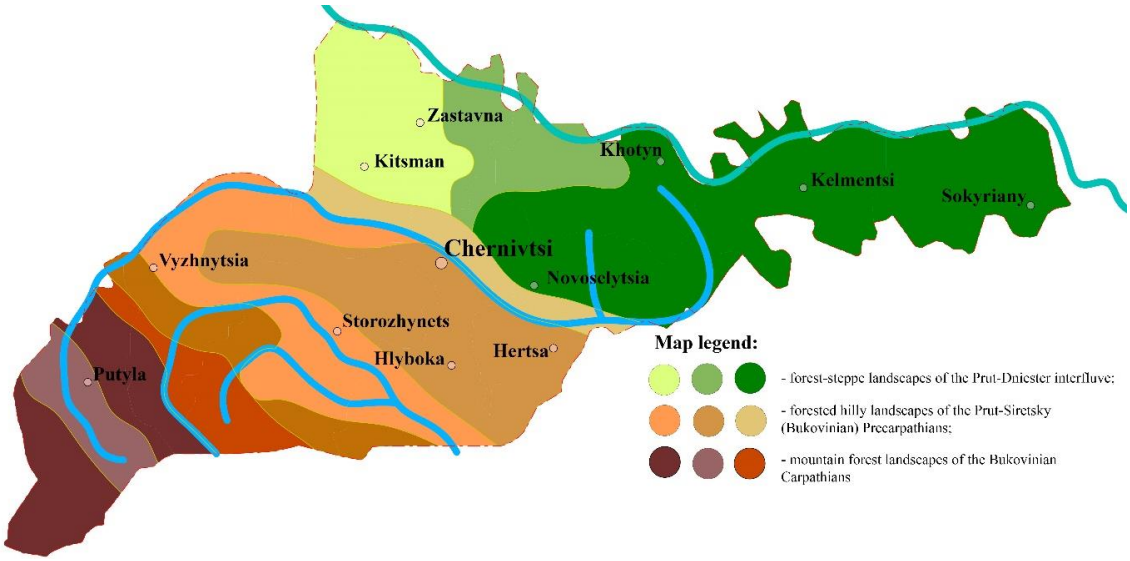

Fig. 1. Map of landscape features of Chernivtsi region [from authors private archive]

Fig. 2. Prut-Dniester interfluve (Dniester canyon)

Fig. 3. Bukovinian Precarpathians (Cheresh village, Storozhynets district) [from authors private archive]

Fig. 4. Landscapes of the Bukovinian Carpathians (Putyla, Putyla district) [from authors private archive]

hills in places rises to 300 m, that it is here that the Dniester forms a real nest of large meanders (between the villages of Oselivka in the west and Babin in the east), in the concave parts of which a series of very expressive terraces arose.

Sokyryany watershed forest-steppe region occupies the extreme north-eastern part of the described region with the predominant absolute heights of about 250 m. It is in this area that the watershed between the Prut and Dniester basins runs at a distance of 10–15 km from the Dniester and 45–50 km from Prut river.

Bukovinian Precarpathians (Fig. 3) is not monotonous and is quite clearly divided into the following landscapes (natural areas):

Brusnytsia natural area is characterized by extremely picturesque landscapes, the area can be used for recreation, but it is necessary to properly organize the area: to build boarding houses, rest homes, motels, small ponds. Catastrophic floods on Cheremosh and Prut and landslides are needed for environmental protection measures.

Chernivtsi ridge-hilly forest area should be arranged as a recreational area; it deserves to create a state natural park of multifunctional purpose from forests: reserve, educational, hunting, for recreation, etc.

Hertsaivsky terrace forest-steppe district is located on the right-bank terraces of the Prut. On the right-bank terraces of this area is the main array of both old and new buildings of Chernivtsi.

Tarashchansky hilly-ridge forest area in many ways of its nature resembles the neighboring Chernivtsi natural area, and is like its south-eastern continuation.

Bagnensky natural area is like a ready-made natural model of such a rare natural phenomenon as river interceptions. It is a good visual aid for

learning about the nature of pupils, students and hydraulic engineers.

Mizhsiretskyy forest terraced area marked scenic views and can be used with recreational purposes. This is also facilitated by the presence of mineral springs (villeges of Banyliv Pidhirnyi, Budenets).

Krasnoilsky ridge-wavy area is bounded on the north by the valleys of the rivers Maly Siret and Siret, and on the south by the Carpathians.

Landscapes (natural areas) of the Bukovinian Carpathians (Fig. 4) – the main forestry and recreational part of Chernivtsi region. The Carpathians in general and the Bukovinian Carpathians in particular are mainly low- and medium-mountainous, covered with forest and meadow vegetation to the highest peaks. Forest and meadow vegetation of the Carpathians has been used by man since ancient times; mountain meadows are meadows for cattle grazing, and forests for construction purposes. The following natural areas are available here:

The Beregomet lowlands form the extreme zone of the Bukovinian Carpathians and rise a very clear and distinct two-hundred-meter ledge above the adjacent foothills.

The Putyla lowlands can be called forested, as meadows and arable lands are so widespread, there are relatively few forests.

Maksymets forest mountained are formed by three pairs of ridges (Maksymets-Pohar, Putyla-Melesh and Mykytyn-Kobyla), which generally correspond to the Montenegrin tectonic zone. It is suitable mainly for tourist recreation.

Yarovytsia forest-mountainous middle mountains – the highest area of the Bukovinian Carpathians, which consists of two mountain ranges: Yarovytsia with a height of 1574 m and Tomnatyk – 1565 m.

Chornodil crystalline highlands occupy the southernmost part of the Bukovinian Carpathians.

It is also possible to consider separately the territory for the development of the city of Chernivtsi: functional zoning, the formation of the planning structure and urban composition. The natural component is one of the most stable and formative factors in the development of the city. Terrain, hydrography and lithological basis play the role of natural base.

According to the classification of B. Kolosok in the work "Urban Heritage of Chernivtsi" relief has six main forms that differ in spatial and visual properties: ridge (shaft), valley, hill, hollow, cape and amphitheater (Fig. 5) [11].

The ridge and the valley have longitudinal axes, the valley with its shape (slopes and bottom) connects the space, and the ridge divides it. The hill and the hollow (conditionally hemispheres) have vertical vector axes, but also differ in spatial and visual properties: the hill divides, and the hollow

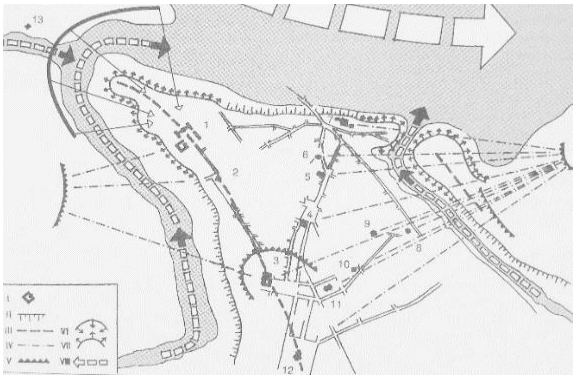

Fig. 5. Map of R.F. Kaindl "Chernivtsi and its environs in 1774" [from authors private archive]

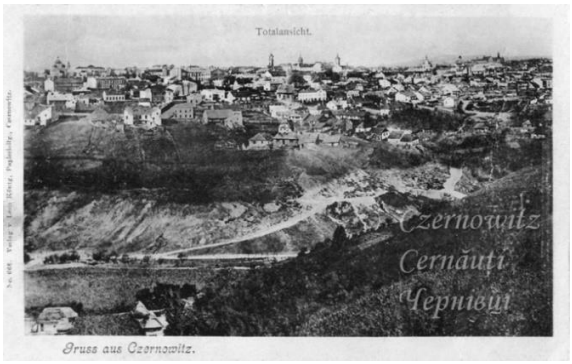

Fig. 6. Historical photo. View of the city of Chernivtsi from the Weinberg [from authors private archive]

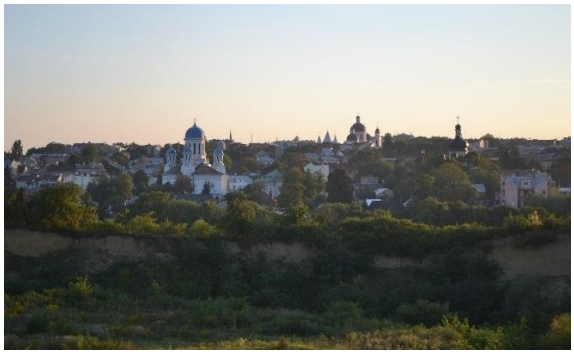

Fig. 7. The current photo. View of the city of Chernivtsi from the Weinberg [from authors private archive]

connects and directs space along its axis upwards. The cape divides the surrounding space, its axis is close to horizontal, directed to the protrusion of the cape and is lost with distance from it. The amphitheater, like a hollow, accumulates the space around it and directs it along the axis of the form. Also, each form of relief differs in compositional activity: hilltops, promontories of capes, watersheds.

As a rule, one of the six forms predominates in the area and is considered the main one. For the city of Chernivtsi, the main form is the valley of the Prut River, which cuts through the hill. It is on this cape that the city of Chernivtsi developed for many centuries, and it is no coincidence that the most

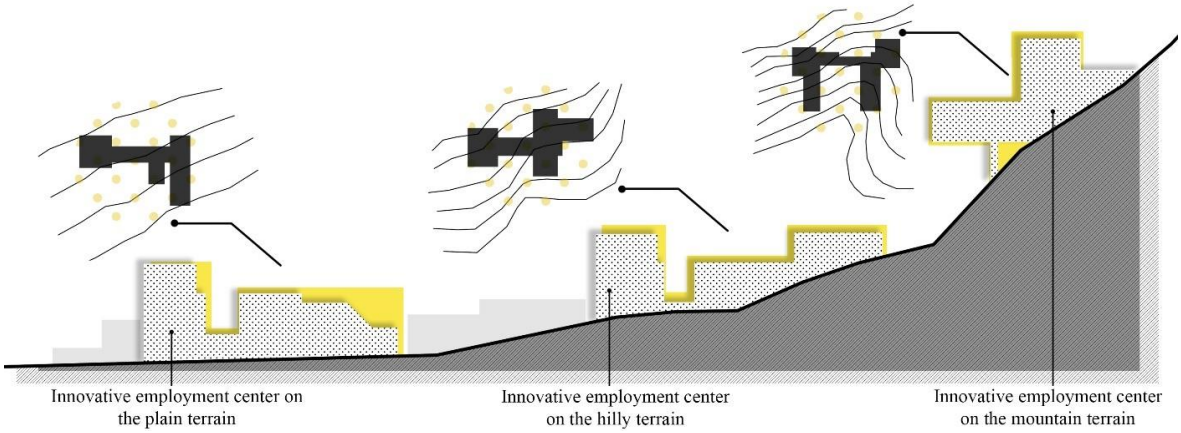

Fig. 8. Types of relief with the image of innovative employment centers: plain, hilly, mountain [from authors private archive]

significant architectural dominants were built on it: the architectural ensemble of the Residence of Bukovinian and Dalmatian Metropolitans, the town hall, etc. (Fig. 6 and Fig. 7).

Therefore, to identify the types of socially-oriented architecture based on the landscapes of Chernivtsi region and the city of Chernivtsi, the following types of relief can be distinguished: plain relief (forest-steppe landscapes of the Prut-Dniester interfluve), hilly relief (landscapes of the Prut-Siretsky (Bukovinian) Precarpathians) and mountainous terrain (mountain forest landscapes of the Bukovinian Carpathians) (Fig. 8) [21].

Video-ecological socially-oriented architecture

The global processes of creating an architectural environment in recent decades have focused on its humanization, and architectural research and construction have received a new direction of development - the creation of architectural structures that are best suited to the requirements of a certain type of population and create a psychologically comfortable environment.

The socially-oriented approach consists in uniting the socially homogeneous groups of the population related by needs, purposes and values and designing of the corresponding buildings, performance of improvement of territories, planning of settlements, etc. One of the types of socially oriented architecture aimed at solving economic problems of certain categories of the population can be innovative employment centers, which will be able to "instantly provide work" for the unemployed using modern methods of architectural organization of the typological group of social centers of vocational guidance and reorientation.

By using innovative design methods, namely the principles of combining various functions in complexes or networks, it is possible to create much more efficient multifunctional facilities, which are more economical use of resources, the ability to introduce new methods and technologies, concentrate human, financial, scientific, industrial and others. resources, etc., which is analyzed on the example of the innovation employment center, the structure of which consists of a combination of basic, auxiliary, additional and service functional areas, where recreation areas with public and courtyard spaces are provided.

The organization of a video-ecological network of innovative employment centers with public and courtyard spaces for workers by permaculture methods plays an important role in improving the socio-economic and emotional-psychological condition of rural and urban populations, revival of "abandoned" areas, preservation and restoration of natural landscapes.

In the architecture and agriculture of the city, the essence of the direction of permaculture is a multi-purpose approach to the territory and the creation of a highly productive ecological system. The main principles of permaculture, which are often used in architectural design are: the interaction of elements, multifunctionality; energy conservation and energy efficiency; use of natural resources in construction and landscaping; conservation; use of renewable energy sources; diversity. The permaculture principle of diversity is the basis of the video-ecological approach to building design.

From the point of view of video-ecology, the application of permaculture methods is to use green facades and roofs of houses, thereby improving their appearance and microclimate, purifying the air. Other ways to create an optimal visual architectural environment from the point of view of video-ecology are: complex shape of the building, which is provided by protrusions, articulations of architectural forms, etc.; variety of colors and details and decoration; optimal rarefaction and thickening of visible elements; compositional selection of dominant volumes; vertical and horizontal zoning of complexes; art therapy, etc. [1; 13].

The possibilities of applying the author's permaculture method of zones were experimentally proved on the example of optimal organization of

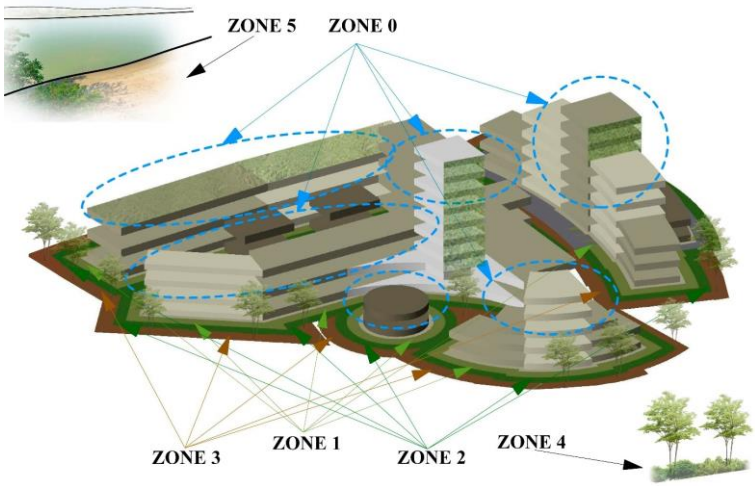

Fig. 9. Application of the permaculture method of zones for landscaping of the territory of the innovation employment center [from authors private archive]

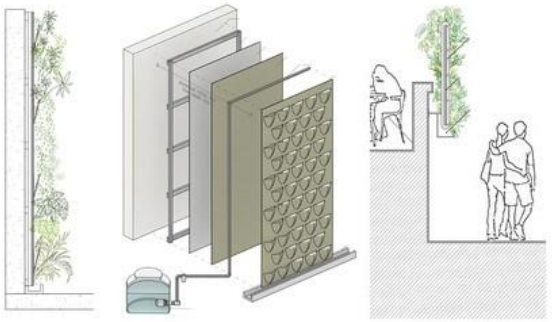

Fig. 10. Example planting facade. Source: Muro Verde / Jardin Vertical [from authors private archive]

the architectural environment of the innovation center of employment with public spaces, based on the frequency of care and needs of plants used in landscaping. Depending on the positioning, you can conditionally select 6 zones (Fig. 9).

"Zone 0" directly includes buildings and structures for which the principles of permaculture are applied in the form of vertical and horizontal landscaping, reducing energy consumption, use of renewable energy sources, environmentally friendly materials and harmless production in the industrial zone of the complex, creating a harmonious indoor environment for work and living, the use of "flowing" green spaces that combine the interior and courtyard exterior.

"Zone 1" is the closest to the building. Landscaping in this area uses such plant elements that require constant care and frequent attention (flowers, etc.). In "Zone 2" are perennial shrubs that need less care. "Zone 3" is used for planting trees that require minimal care. "Zone 4" includes the surrounding landscaping, which is in a semi-wild state and is very rarely maintained. "Zone 5" is a recreational natural landscape in which no person interferes, except for observation.

When applying permaculture methods, the most important thing is to take into account the influence of the landscape component on the design of buildings. Different types of terrain can have excellent vegetation, relief structure, which directly affects the creation of green roofs and facades (Fig. 10). The type of relief determines the spatial planning structure of the building, transport accessibility, the availability of public spaces and so on.

When creating an architectural and spatial composition in various landscape areas should take into account the following factors:

Ecological and conservation, which are to minimize the impact and reduce the destruction of existing natural landscapes;

Functional and hygienic – the use of appropriate to the functional processes of spatial planning solutions of buildings, which protects people from the adverse effects of natural and man-made environment, as well as minimizes the negative impact on the environment;

Economic – the creation of investment-attractive complexes;

Psychological and aesthetic – the formation of appropriate to the video-ecological principles of the architectural environment, which will beaesthetically attractive and psychologically comfortable for person.

Public spaces with using the natural component at innovative employment centers

As a rule, public spaces are a set of interconnected undeveloped (water, green) areas around innovative employment centers, which contribute to the improvement of the environment, improve the conditions of public recreation, enrich the appearance of the territory, contribute to the protection of the natural landscape. They are part of the structure of open architectural spaces.

Open architectural spaces are all undeveloped spaces that form the structure of the city or divide it into separate built-up areas. Public and intra-quarter spaces are objects of open architectural spaces. They differ in certain sizes, configuration, ratio of natural and artificial components, functional content, microclimatic and sanitary-hygienic characteristics, as well as the role in the formation of the architectural and artistic appearance of the environment.

In modern conditions the problem of formation of such public spaces in which the natural basis of a landscape is kept or there are only separate inclusions of anthropogenic elements acquires great value. They have the greatest value in terms of connections "socially-oriented architecture (innovative employment center) – nature", as they are the accumulators of ecological balance and represent their own natural environment.

Public space of any size and purpose actually performs not one but several functions: recreational, communication, social and business, economic, commercial, etc.

The optimal ratio of functions of each space can be found only taking into account the distribution of functions throughout the system of innovation employment centers.

The design of public open spaces (courtyards, squares, recreation and sports grounds, walking areas, etc.) at innovative employment centers on the plain, hilly and mountainous terrain should have similar and distinctive features, such as: harmonious fusion of architecture with the natural landscape; the connection of internal spaces with the external natural environment, the opening of viewpoints on nature, the creation of "buffer spaces" – courtyards and covered atriums with their microclimate; construction of "building on columns", due to which the ground under the bottom is released as much as possible (for hilly and mountainous terrain); creation of "gardens on roofs" – return to the nature of the space of the earth taken away from it; use of environmentally friendly natural materials;

Transfer of internal transport links, parking spaces, storage areas on the territory of the complex underground, thus freeing up space for green recreational spaces.

Conclusions

As a result of solving the formulated goal of the research – the analysis of the landscape component of permaculture as a way to create video-ecological architecture (on the example of Chernivtsi region), important practical conclusions were formulated. The scientific novelty of the study is as follows:

1. An array of new source materials, including personal field research of the authors, which influence the creation of modern landscape formation, has been brought to scientific circulation.
2. The basics of the methodology of research of the video-ecological component with the use of permaculture approaches for analysis, assessment, modeling and forecasting of the impact of urban landscapes on the system of preservation and development of the environment are proposed. The scientific novelty of the study is the use of landscaping as a way to improve the quality of the architectural environment of innovative employment centers and public spaces in combination with a high level of aesthetics.
3. Attempts to introduce a video-ecological direction in the development of architecture in Chernivtsi region, based on the creation of innovative employment centers by permaculture methods, which can minimize human impact on the environment and initiate a culture of ecological lifestyle.
4. The authors' study proved that in the initial analysis of the landscape of Chernivtsi region it is advisable to conduct research in the field of organizing innovative employment centers on different types of terrain with the use of energy-saving technologies, support of the existing green framework, eco-technologies and others.
5. Such innovative approaches with the use of permaculture in the formation of video-ecological socio-oriented architecture are relevant today, as they contribute to the creation of a new typological unit – innovative employment centers with open public spaces.

The practical significance of the results is the possibility of their use:

- to manage urban development in a post-industrial economic model, characterized by significant changes in environmental, social structure and cultural worldview. The proposed model is designed to avoid possible crises in the development and use of natural landscapes.

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Kopsavilkums. Rakstā analizētas un pētītas pilsētu un lauku iedzīvotāju ekonomiskās problēmas, ekoloģiskā un emocionāli psiholoģiskā ietekme uz urbanizēti vizuāli piesārņoto vidi. Aprakstīti un analizēti permakultūras principi un video-ekoloģija. Pētījuma mērķis ir izvērtēt permakultūras ainavas komponentu kā video-ekoloģiskās arhitektūras veidošanas veidu. Izvērtējums un izpēte veikta uz Čerņivcu reģiona piemēra Ukrainā.

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Characterizing sustainability aesthetics of buildings and environments: methodological frame and pilot application to the hybrid environments

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Abstract. Growing environmental awareness and emerging design and performance requirements related with the implementation of sustainability goals inevitably have an influence on construction, architecture, urban design and the development of our built environment in general. This influence is reflected both in the increasingly efficient ecological performance of built structures and the growing array of related technologies, and in the aesthetic expression of these environmentally conscious designs. The aesthetic expression of sustainability concept and values is sometimes referred to as sustainability aesthetics. The aim of this research is to develop and test a methodological framework for characterizing the sustainability aesthetics of the built environments. The elaborated methodological framework integrates biophilic design, sustainability aesthetics, regenerative design and genius loci as the most promising approaches, allowing the integration of human and environmental concerns. To test the framework, we selected historic built environments that reflect long-lasting sustainable co-existence between humans and their environment and represent hybrid characteristics of both architectural and urban space. One of the purposes selecting these environments for the case study was to determine the features of an organically evolved sustainability aesthetics that could become a valuable source of inspiration for architectural design and management of the built environments.

Keywords: sustainability aesthetics, hybrid environments, biophilic design, regenerative design, *genius loci*

Introduction

Relevance of research

Growing environmental awareness has raised new challenges for architecture and urbanism of the 20th and 21st centuries. Currently terms "sustainable", "green", "ecological" and many others are used daily in scientific literature and media to characterize contemporary built environments. In some cases the "sustainability" label is used for marketing purposes [8]. Vague definition of what sustainable buildings and environments are, causes many scientific discussions [2]. However, the newest debates [2] consider sustainable development as a way of thinking or the direction rather than a single, strictly defined term. Moreover, as C. Owen and K. Dovey [27] note, "sustainability is not a field with institutional boundaries like architecture", yet is straddles multiple fields including architecture, engineering, urbanism, ecology etc. Herewith, building or any other structure could be considered as sustainable if it is built in an ecologically oriented way that reduces its impact over the environment [2] or even increases the quality of the environment [29]. The concept of sustainability, that could be considered as the first intentional paradigm shift in human history [13], is constantly revised and expanded. The trends of thought of the last decades [2, 10, 13, 20] reveal the shifts in sustainability paradigm that go beyond the sustaining status quo towards systemic, dynamic, organic, holistic and non-linear approach [20]. The emerging concepts of restorative, regenerative sustainability [29] illustrate the aspiration to restore the lost connection with the natural world and to move towards harmonious co-existence between humans and nature and human-nature co-creation in the living environments of the future.

These changes in the attitudes towards the environment in essence change the architectural expression as well. C. Cucuzzella [8] raises the question: is it possible that "the environmental imperatives are actually imposing a shift in the textual narratives, the visual expression, and the spatial experience of architectural projects?" Actually contemporary design trends move towards so-called "greening" of architecture and urban environments (for example, Barcelona greenery and biodiversity plan) and implementation of environmentally conscious design strategies (for example, biophilic design, biomimicry, regenerative design, cradle-to-cradle approach) that change the aesthetic expression and image of built environments. The emerging trends of peculiar aesthetics of sustainable environments and environmentally conscious building design call for new approaches for understanding and characterizing the sustainability aesthetics [21; 32] of the living environments.

Research aim

The aim of this research was to analyze the existing experience and possibilities of characterizing the sustainability aesthetics of buildings and built environments and to develop and test the methodological frame for this characterization. In order to reach this aim, the literature review of the existing characterization frameworks applied to the environmentally conscious designs was carried out, the existing research gaps were identified and the characterization framework based on the integration of four approaches - biophilic design, sustainability aesthetics, regenerative design and *genius loci* - was developed and tested using as a case study the hybrid built environments in the historic center of Kaunas city.

Research methods

The type of this research is qualitative descriptive study. The methods of research include: literature analysis, concept mapping (mind mapping), comparison and systematization, on-site observation, photographic survey, map analysis, graphical analysis, descriptive analysis. The novelty of this research consists both of development of the framework for characterizing the sustainability aesthetics of buildings and built environments and its testing but also of the employment of mind mapping technique in the research development process and visualization. Mind mapping can be defined as the technique used in brainstorming and allowing deconstructing complex topics by creating a graphical representation of constituent subtopics and related themes [23]; moreover, it allows easier determining and perceiving links between concepts; it is handy for visual representation as well. C. Tattersall et al [33] discussed the possibilities to use mind mapping in scientific qualitative research for such purposes as transcriptions of qualitative interviews and other types of analysis of qualitative data.

Theoretical background and methodology

The relevance of integrative approach in sustainability assessment

In a previous study [18], we analyzed sustainability assessment frameworks and sustainability certification systems for buildings and built environments. Some authors [36] distinguish separate groups of human and ecological criteria in building sustainability assessment systems. Our analysis of the main certification systems (BREAM, LEED, WELL, Living Building Challenge) demonstrated that the majority of criteria applied are two-dimensional, include, for example, an environmental and an economic dimension or an environmental and a social dimension. It is noted that BREAM and LEED focus on the environmental dimension, while the WELL system focuses on social issues. Fully sustainable development can only be envisioned if sustainability is attained in all its dimensions: environmental, economic, social, and cultural [9]. In conclusion, on the way to the restorative and the regenerative sustainability and design, to a co-evolution of humanity and environment [2; 13; 20], approaches are needed that integrate in a synergistic way human (social, cultural, economic) and environmental criteria.

Moreover, the psychological significance of the environment for human well-being has been highlighted in various recent studies. The concepts of psychologically sustainable architecture [3; 25; 28] and „neuro-architecture“ by M. Bond, 2017 [3] consider the psychological impact of the built environment. In this study we consider aesthetics as a sensory experience and in this the visual experience, although probably the most powerful, forms only part of the whole. Therefore, the methods of aesthetic research commonly used in the humanities, such as analysis of composition that are focused on visual evaluation do not meet the goals of this study. M. DeKay's study on the levels of aesthetic perception of sustainable design [14] encouraged us to distinguish other sensory aesthetic features that have also been described in biophilic design patterns, the genius *loci concept*, and sustainability aesthetics. Many of these features are intangible, e.g. time and change, interaction of light and shadow, and often involve psychological aspects such as feelings of safety and protection, risk-peril or curiosity. It is thus possible to surpass the limits of the simplest visual understanding towards further sensory levels of perception and aesthetics – phenomenological, process, ecological or evolutionary [14].

As a result, the four approaches - biophilic design, sustainability aesthetics, regenerative design and genius loci - were identified as having the potential for both the development of three- and four-dimensional criteria for sustainability assessment and the further development of a particular aesthetic expression of sustainability (Fig. 1), which, is still underdeveloped and lags behind the technological, performance-oriented advances in sustainability [38]. The following is a description of the four approaches mentioned above.

Biophilic design

The biophilia hypothesis, which is the basis of increasingly popular biophilic design approach, was developed in 1984 by biologist and philosopher E. O. Wilson. Biophilia hypothesis can be briefly expressed as "innate emotional affiliation of human beings to other living organisms" [37]. According to J. Krčmářová [24], the biophilia hypothesis was both the outcome of thorough human-environment

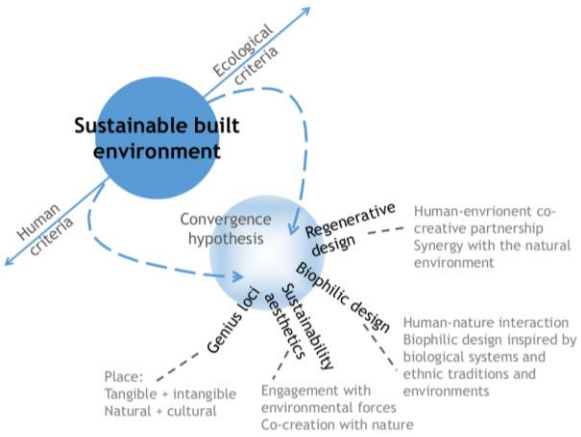

Fig. 1. Concept map of potential synergistic approaches in development and assessment of sustainable built environment [2, 7, 17, 18, 20, 21, 34, 35]

interaction study, but at the same time had an ethical motivation: E. O. Wilson [37] was striving towards "greening" of science and restoring broken human-natural environment connection. Biophilia currently serves as guideline for architectural and urban design [22] but at the same time it is presented as one of biological landscape aesthetics theories [26], stating that our innate affiliation with nature determines aesthetic preferences towards the environments and emphasizes the importance of natural diversity of species and of landscape types. This approach tends to integrate human well-being and healthy physical and psychological development, aesthetic preferences and nature conservation. Several sets of biophilic design guidelines and sets of patterns exist [4, 22]. For example, S. Kellert et al. [22] distinguish six elements of biophilic design - environmental features, natural shapes and forms, natural patterns and processes, light and space, place-based relationships, evolved human-nature relationships - with an array of corresponding attributes. W. Browning et al. 2014 distinguish 14 patterns of biophilic design [4] that are subdivided into three major categories: nature in the space, natural analogues, and nature of the space. Both sets of guidelines correlate highly, although the elements and attributes by S. Kellert et al. [22] are more detailed and the patterns presented by W. Browning et al. [4] are more abstract.

The biophilic design approach distinguishes and discusses aesthetic features encompassing not only visual but also sensory-behavioral (interest, approachability, exportability), cognitive (complexity, organization, modernity, naturalness and beauty) and emotional features, as described in the 2020 study of aesthetic experience by Coburn, et al [6]. The results of their study indicate that „the most salient psychological experiences in the built environment are likely generated by the integration of cognitive, emotional, and sensory information" [6]. Applying the biophilic design approach to the design of sustainable buildings entails these three major components of aesthetic experience that are not typically considered by sustainability assessment systems. The complex system of biophilic patterns by W. Browning et al. [4] was too extensive and abstract to briefly and accurately describe aesthetic features. Therefore, the six elements distinguished by S. Kellert et al. [22] were selected as the basis for a concept map describing aesthetic features to characterize sustainable buildings and environments.

Sustainability aesthetics

Even if current implementation of sustainability paradigm is more technologically oriented, the research on the visual culture in the context of sustainability [8] is taking its ground as well. Such authors and researchers are S. J. Zafarmand et al. [39], S. Kagan [21], C. Cucuzzella [8], I. Di Carlo [11]. According to C. Cucuzzella [8], the more complex understanding of the connection between materials and form choices in the sustainable design is needed; moreover, design aesthetics can have re-directive impact towards more environmentally conscious behavior [8, 32]. S. J. Zafarmand et al. [39] distinguish seven attributes relevant to the aesthetics of sustainability: aesthetic durability; aesthetic upgrade-ability and modularity; simplicity and minimalism; logicality and functionality; natural forms and materials; local aesthetic and cultural identity; individuality and diversity. S. Kagan [21] presents the definition of sustainability aesthetics applicable in various contexts: such aesthetics is focused on relations and processes and is based on a "sensibility to patterns that connect at multiple levels and at the same time is attentive to complexity and highlighting the beauty of the complementarity of antagonisms". He distinguishes such features of sustainability aesthetic as: relation-centered; process-centered; attentive to complexity; combining and contrasting unity; complementarity of antagonisms; open to uncertainties, generativity of chaos, and agitations of disorders.

Regenerative design

Regenerative design is design concept stemming out of regenerative sustainability movement. The field of its application ranges from buildings [2] to landscape management and agricultural practices [17]. According to Ch. du Plessis [13], the regenerative paradigm seeks to "engage with a living world through its emphasis on a co-creative partnership with nature based on strategies of adaptation, resilience and regeneration." This paradigm bears similarities with sustainability aesthetics approach through its co-creative partnership with nature. Different authors distinguish what regenerative design intervention should be like: according to B. Duarte Dias [12], it should be "highly efficient and low impact" and "integrated with the unique local ecosystems and community, co-creating and developing place to its full potential"; according to A. D. Istiadji et al. [20], such interventions should create "healthier and more resilient living quality and equity of community";

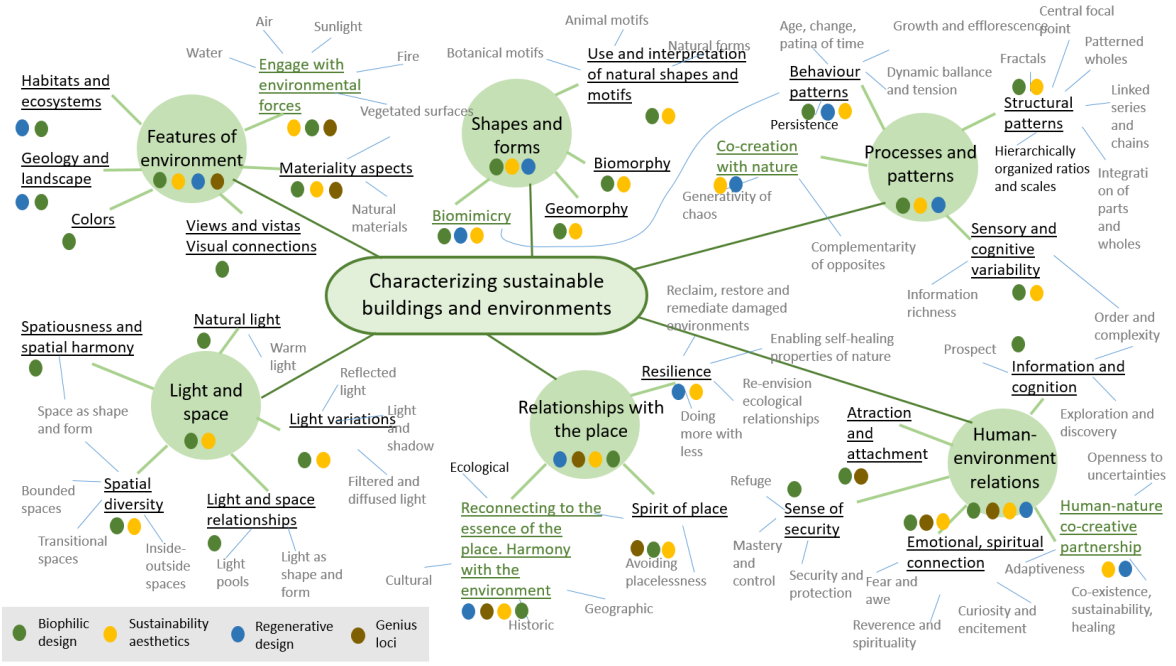

Fig. 2. Concept map demonstrating the interrelations between the above presented approaches and the selected criteria for characterizing sustainable buildings and environments [2, 4, 13, 20, 21, 22, 34, 39]

according to U. Berardi [2], such intervention can become a "live system with dynamic flows with nature". Even if presented definitions sound like mainly technological challenge, numerous authors [17, 20] argue that the change of the world view is of equal or even greater importance. According to A. D. Istiadji et al. [20] the main challenge in achieving the regenerative paradigm is cultural and human psychological one. This once again reveals the relevance of aesthetic expression in solving what appears a technological challenge from the first glance.

Genius loci

According to V. Stauskas [30], one of the design challenges of the 21st century is to transfer or embody the spirit of place (*genius loci*) in all contemporary architecture. *Genius loci* is usually defined as "as the unity of the tangible and intangible components of the <...> environment, forming the uniqueness of the place" [31] and in the recent years with the advent of the historic urban landscape concept is seen not only as heritage preservation issue bus as a resource for urban development [31] and sustainability [34]. Genius loci, being the intangible quality of a tangible place, perceived both physically and spiritually [19, 31, 34] links spatial and intangible, natural and cultural aspects of the place and its sustainable development. Empathetic involvement with the place both of designers and users can lead to the phenomenon called topophilia – the love of place [26] - the powerful motivator for the environmentally conscious behavior.

The concept map demonstrating the interrelations between the above presented approaches and the selected criteria for characterizing sustainable buildings and environments is presented in the Fig. 2. The criteria characteristic to these approaches were distinguished in the course of analysis of literature sources: the main sources for biophilic design criteria were S. Kellert et al. [22] and W. Browning et al. [4]; the main sources for sustainability aesthetics were S. Kagan [21] and S. J. Zafarmand et al. [39]; the main sources for regenerative design were Ch. du Plessis [13], U. Berardi [2], A. D. Istiadji et al. [20]; the main source for *genius loci* in the context of sustainability was M. Vecco [34]. Aesthetic features described in sustainability aesthetics, regenerative design and genius loci concepts correlated highly with features provided in biophilic patterns, however, there were valuable insights that supplemented the set of criteria. It has also allowed us to distinguish the most important aesthetic features introduced by the four theories and to group them in to the complex system.

All the involved criteria can be subdivided in three groups according to their relation with aesthetic expression and perceptions of the object under consideration: 1-characteristics that define visual expression (for example, colors), 2-characteristics that influence visual expression (for example, behavior patterns), 3-criteria that define aesthetic response (for example, emotional, spiritual connection) (Fig. 4). The *human-environment relation* group includes all the criteria defining aesthetics response. The group *light and space* contains solely the characteristics that directly define visual expression. The group *relationships with the place* contains solely the characteristics that indirectly influence visual expression. The group *features of environment, shapes and forms, processes and patterns* contain both the characteristics that define visual expression and the characteristics that influence visual expression. As the

TABLE 1

Questions for the assessment of aesthetic expression of sustainable buildings and environments [2, 4, 13, 20, 21, 22, 34, 39]

Features of environment	- Are there visual connections between the object and its environment present? - Does the object involve variety of colors characteristic to the environment of locality? - Does the object adapt to local terrain and landscape conditions? - Do the object's design and / or functioning involve landscape restoration? - Does the object express the engagement with environmental forces (water, air, sunlight...) in meaningful and visible way? - Does the object integrate local natural materials? - Does the object integrate ecosystems and habitats in meaningful and visible way?
Shapes and forms	- Does the object's design integrate / interpret natural (botanical, animal...) forms and motifs? - Is the object's design based on biomorphic shapes? - Is the object's design based on geomorphic shapes? - Does the object's design mimic nature's forms in functional way?
Light and space	- Does the object integrate / provide natural light? - Are light qualities variations, such as diffused, filtered light, light and shadow, reflections present in the object? - Is the interplay between light and space integrated in the object's design in meaningful way? - Is the spatial diversity / variability integrated in the object? - Are the meaningful connections between spaces present in the object? - Does the object create the feeling (image) of spatiousness and harmony?
Relationships with the place	- Does the object maintain / contribute to the spirit of place? - Does the object involve restoration of the damaged environment in meaningful and visible way? - Does the object contribute to ecological relationships of the locality in meaningful and visible way? - Does the object employ / demonstrate self-healing qualities of nature? - Does the object connect to the essence of the place in ecological, cultural, historic, geographic dimensions? - Is the object harmoniously integrated in landscape / cityscape?
Processes and patterns	- Does the object create sensitive and cognitive variability and / or richness? - Does the object express the process of co-creation with nature? - Does the object express the structural patterns related with fractality, centrality, part-whole integration? - Does the object express in meaningful and visible way the behavior patterns characteristic to natural systems and organisms?
Human environment relations	- Does the object stimulate exploration and cognition? - Does the object stimulate the sense of security in users and viewers perception? - Does the object stimulate the sense of attraction / and attachment in users and viewers perception? - Does the object stimulate emotional, spiritual connection with it and its place in users and viewers perception? - Does the object evoke the feeling of continuous human-nature co-creative partnership?

aesthetic perception of ecological environments goes beyond what is immediately visible [14], these criteria, that involve both the appearance, its causes and the aspects of perception can be valuable in constructing the tools for design and better understanding of sustainable environments. Table 2 presents a series of questions formulated in this research aimed at guiding the interpretation of sustainable building or built environment.

Application: case of courtyards as hybrid environments

Definition of courtyards and their relevance.

According to the definition of the courtyard in Cambridge Dictionary [5], the word describes a flat ground area outside, which is partly or entirely surrounded by the walls of a building, with a hard or grass surface depending on the culture and the region. Most of the time, courtyards can be associated with warm climates due to the need for an

Fig. 3. The scheme demonstrating the solid and void space analysis of the segment of the New town of Kaunas and two courtyard spaces selected for further analysis [from authors private archive]

outdoor seating area with shade and water elements. However, courtyards can have other usages as well. According to Edwards et al. [15], courtyards were used as primary meeting places with various functions such as gardening, cooking, working, resting. Therefore, they can provide semi-private spaces for the inhabitants with the specified borders in the cities' urban fabric. However, when the courtyards are in between the block of apartments rather than part of an architectural element of private houses, the management of these spaces can become problematic. Nowadays, most of the courtyards do not contain a lot of function rather than being a parking lot. However, as it is stated by Almhafdy et al., 2013 [1], courtyards can be commonly applied as an element in architectural design in the environment due to their social, environmental, and therapeutic potentials. In that regard, it is possible to evaluate them as hybrid environments that can administrate various functions that support sustainable development. Furthermore, these spaces provide the possibility to their inhabitants regarding the coexistence of different functions and different people, which makes them open to diversity.

As it is presented by the United Nations Sustainable development goals, goal 11 recognizes universal access to green and public spaces for the people [16]. Furthermore, due to the recent developments in the world, that were caused by the Covid-19 pandemic, the requirement for open spaces, where people can spend time, increased. Therefore, it is essential for people to have access to these courtyards as well as green spaces where they can linger. However, the motivation for spending time in these areas can be various and different from individual to individual. Examining the characteristics and the reasons for visiting courtyard spaces can help to understand their usage potential, and furthermore, it can help to offer relevant functions for supporting sustainability and distinctive aesthetics of these environments. In that regard, a case study area was selected in the New town of Kaunas, Lithuania, which accommodates variously sized and shaped courtyards.

Research process

The research process can be subdivided into several steps. In the first step, the borders of the case study area were decided by the analysis on the map of Kaunas. The segment which was selected for the research is around Nepriklausomybė Square with St. Michael the Archangel's Church, which is located on the main axis of the New town area. In the second step, the courtyards in the selected area were analyzed by the solid and void space analysis to understand the size and shape of them in the two-dimensional plane (Fig. 3.). After this step, the selected area was investigated by visiting the sites to evaluate the spatial configuration of these courtyards; therefore, the analysis at the site involved taking photographs and making sketches of the space. In the investigation process, the courtyards were visited in two different seasons. The first visit was in autumn (October 2020), and the second visit was in summer (June 2021). After all these three steps, two different courtyards were selected as the case study subjects of this research (Fig. 3). The further analysis of two selected courtyards in order to identify their sustainability aesthetics characteristics included: additional on-site observations and photographic survey, graphical analysis and visualization, and descriptive qualitative analysis attempting to answer the questions presented in the table 1. For the graphical analysis and visualization of sustainability aesthetics characteristics the set of icons was developed and applied (Fig. 4).

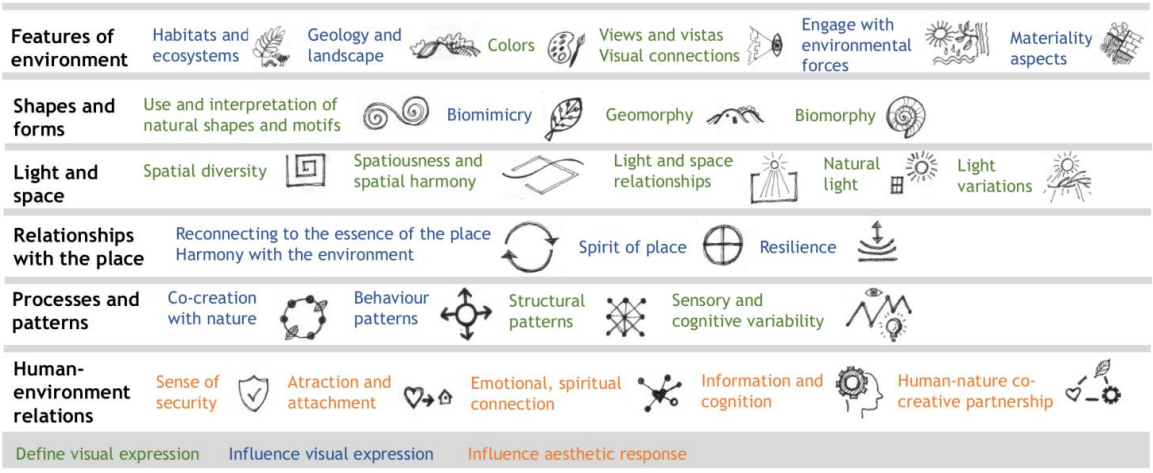

Fig. 4. Icons representing criteria for characterizing sustainable buildings and environments developed in the course of the research and applied in the graphical analysis of the courtyards [from authors private archive]

Research results

The first courtyard (Fig. 5) is at the south-eastern part of the Nepriklausomybė Square, which has a small entrance from the main street. Therefore, the visibility of the courtyard is low and open for surprises for the people who enter it. The courtyard has only one entrance, which makes it a lot more semi-private when it is compared with the other courtyard. In the middle of the courtyard, there is a brick building located that contains geometrical decorations on its façade. When the courtyard is analyzed as a whole, the brick building can be regarded as the centre of the space. The other buildings which are surrounding the courtyard are mostly brick as well, and only one of them contains plaster. Therefore, there is the red brick color dominancy in the courtyard.

The building which occupies the central place in the space is closer to one of the edges, which establishes a smaller pathway to the back part of the courtyard and creates a transitional space. Due to the high walls and the spatial composition of this area, there is limited access to the natural light in this area which makes a shaded space both in autumn and summer. Therefore, the light around this place is filtered. The ivy which is covering one of the façades in this pathway gives a vivid colour and a contrast to space. Furthermore, there are small marble art objects located on the windowsills. In that regard, it might be possible to state that this specific part of the courtyard establishes a sense of place, and it is open for emotional connection for the people who are experiencing it. The usage of the courtyard is mainly as a parking lot, however, a small area as a playground is separated at the corner of the space, which gives the impression that this part of the courtyard is more of a living space when it is compared with the other parts. Therefore, the front part of the courtyard evokes the impression which suggests that it is more commonly used by the inhabitants, while the back of the courtyard seems more discarded. However, the same characteristic of the courtyard also stimulates curiosity and exploration for the people who spend time there.

The storage units which are located at the back part of the courtyard are abandoned and contain considerable decay. The minor part, which is between the border of the courtyard and the storage units, contains trees and weeds, which creates an impression that this part of the courtyard is not actively used and not well maintained by the users. However, due to the massive branches of the trees and the limited area for the movement, this part of the courtyard has an engaging identity. The courtyard as a whole is a hybrid environment which is the result of the human and nature co-creation.

The second courtyard (Fig. 7) is on the opposite side of the first courtyard, and it also has an access point from the main street. However, since it is part of an empty plot rather than being an identified space as a gateway for the courtyard, it does not establish the feeling of an entrance. The courtyard has another opening by an archway from the Nepriklausomybė Square at the side, which contains more of a characteristic of an entrance. Furthermore, the east side of this courtyard also contains the parking lot of the next building, which does not help to have strict borders and establishes an impact that space is not fully identified. As it was detected on the first courtyard as well, this courtyard consists of a building in the middle of it, however, the building divides the courtyard into two different parts rather than being at the centre. The front façade of the central structure has columns which give it an impression of a monumental building. However, when the back façade of the same building is analyzed, it is possible to detect that this part of the structure is quite abandoned, and there is a large amount of decay. Therefore, the sensation which it

Fig. 5. Photographic survey and analysis for the first study area. The particular aesthetic expression of criteria for characterizing sustainable buildings and environments: 1 - sense of place, growth and efflorescence, characteristic brick color, prospect; 2 - sense of security, growth and efflorescence; 3 - sense of security, attraction and attachment, growth and efflorescence; 4 - prospect, openness to uncertainties; 5 - patina of time; 6 - habitats and ecosystems, engagement with environmental forces, openness to uncertainties; 7 - habitats and ecosystems, exploration and discovery, engagement with environmental forces, openness to uncertainties, light variations, inside-outside space

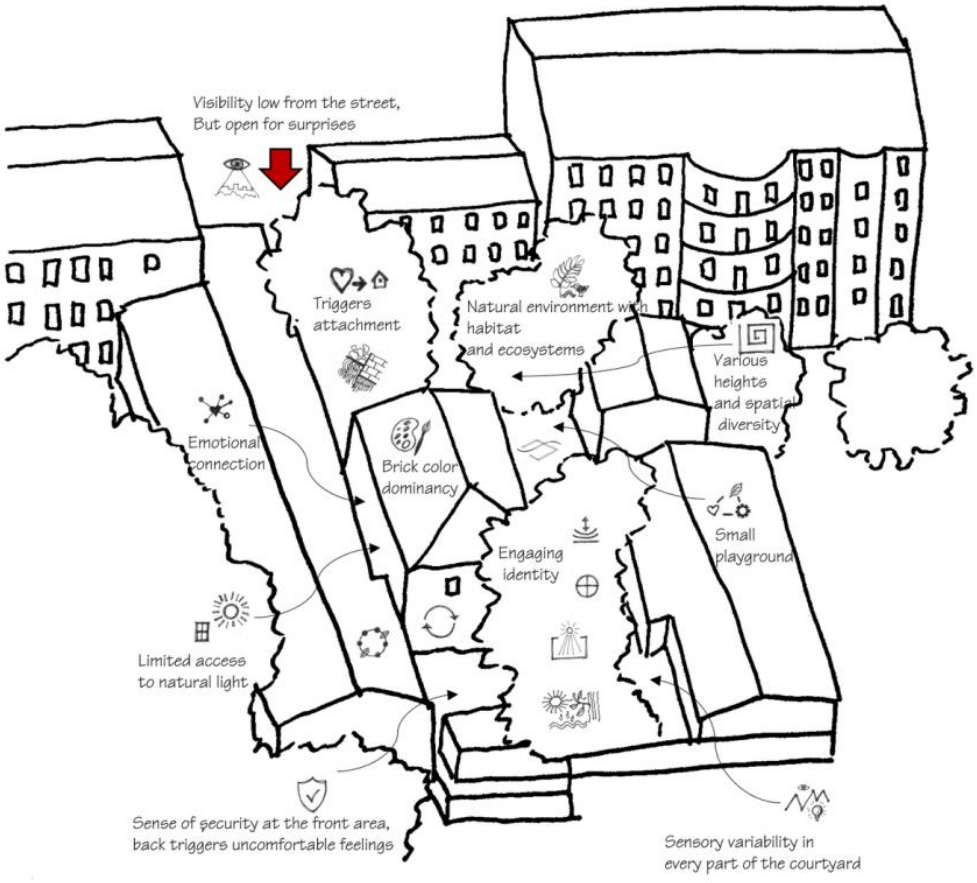

Fig. 6. Graphical representation of sustainability aesthetics features in the first study area

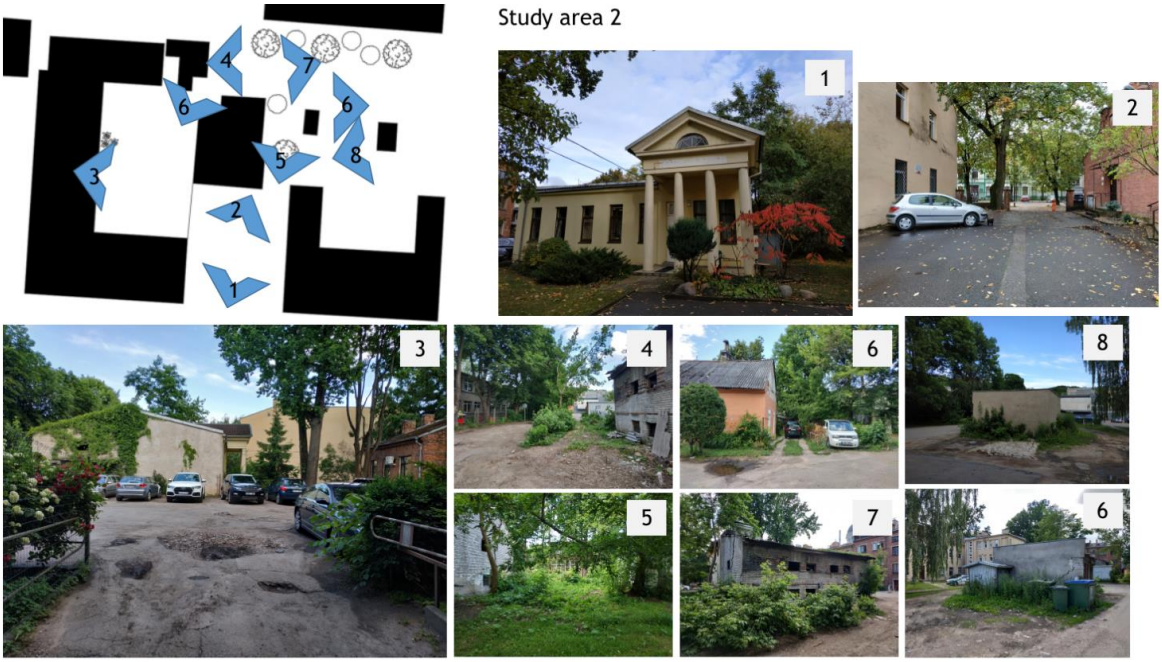

Fig. 7. Photographic survey and analysis for the second study area. The particular aesthetic expression of criteria for characterizing sustainable buildings and environments: 1 - colors, sense of security, sense of place; 2 - prospect, transitional space; 3 - prospect, sense of security; 4 - exploration and discovery, engagement with environmental forces, openness to uncertainties, cognitive variability; 5 - habitats and ecosystems, growth and efflorescence; 6 - resilience, habitats and ecosystems, sense of security, information richness, adaptiveness; 7 - exploration and discovery, engagement with environmental forces, openness to uncertainties; 8 - transitional spaces, habitats and ecosystems, prospect; 9 - transitional spaces, habitats and ecosystems, prospect

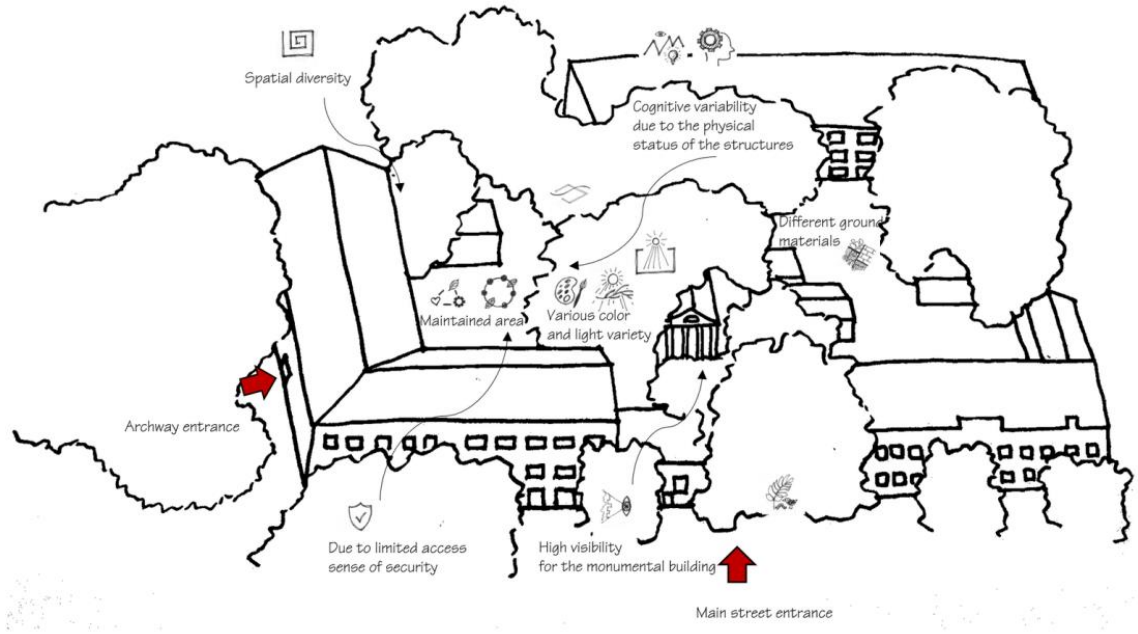

Fig. 8. Graphical representation of sustainability aesthetics features in the second study area

establishes on the observers of the space is different from the other parts of the courtyard. The entrance with the archway has more limited access, and due to the fences at the edges of it, it is more of a private territory when it is compared with the other parts of the space. The fences in this area create a division with the other parts of the courtyard and draw its borders more clearly. The usage of this part of the courtyard is mainly as a parking lot for the buildings which establish the edges of the space. The façades which are facing this part of the courtyard have various materials and patterns with different spatial compositions.

The second half of the courtyard has a less private identity which establishes the impression that it is more of a public space rather than owned by the buildings nearby. However, the area next to the monumental structure is used by the inhabitants of the building, and it is better maintained. The existence of the fruit trees and the small shed near

the building creates more of a countryside environment rather than an urban fabric. Furthermore, due to the close location of the fruit trees to the structure, they filter the natural light and establish a space that mostly contains shade.

When the courtyard is analyzed as a whole, it is possible to state that it catalyzes different emotions and impressions in each section of it since it has various characteristics. However, it also establishes the sensation that even though it is a hybrid environment, the different parts of the space are not well integrated to each other and they contain different stories both physically and emotionally.

Discussion and Conclusions

The intentional paradigm shift towards sustainability in the last decades of the 20th century and continuous development and application in various fields of sustainability concept change the predominant attitudes towards environment and the design expression and aesthetic perception as well. Besides the increasing ecological performance of buildings and related technological advancements the notion of particular aesthetic expression of sustainability ideas in our living environments is unfolding as well and it is sometimes referred as sustainability aesthetics. However, the qualitative aesthetic side of sustainability paradigm is much less explored compared to quantitative performance side and it is possible to conclude that sustainability aesthetics of the built environments still lacks its own vocabulary.

As it was mentioned above, the concept of sustainability is evolving towards restorative and regenerative and towards the goal of co-evolution of humanity and environment. Such development will require the integrative approaches towards the living environment that integrate environmental, economic, social, and cultural sustainability dimensions in a synergistic way. Biophilic design, sustainability aesthetics, regenerative design and *genius loci* were distinguished as such integrative approaches and applied in the elaboration of methodological frame for characterizing sustainability aesthetics. The concept map approach was selected for developing and visualizing the methodological frame, which was organized around six elements - features of environment, shapes and forms, light and space, processes and patterns, relationships with the place, and human-environment relations - adapted from S. Kellert et al. [22]. The distinguished criteria grouped around these elements can be subdivided into: defining visual expression (for example, colors), influencing visual expression (for example, behavior patterns), defining aesthetic response (for example, emotional, spiritual connection). These criteria that involve the appearance of the building or environment, its causes and the perceptional aspects were further developed into a series of questions to evaluate the particular space or design.

For testing the developed methodological frame, the courtyards in the historic environment of New Town of Kaunas reflecting long-lasting sustainable co-existence between humans and their environment and representing characteristics of both architectural and urban space were selected. The analysis process involved map analysis, on-site observations and photographic survey, graphical analysis and visualization, and descriptive qualitative analysis attempting to answer the sustainability aesthetics related questions developed in the methodological section.

The analysis of the courtyards has demonstrated that these spaces of quite simple layout create the impression of complex, dynamic, emotionally involving environments from the human eye level. The majority of distinguished characteristics, except ones requiring intentional sustainability oriented design (such as biomimicry), were identified in the analyzed courtyards. It was determined that some sustainability aesthetics characteristics have evolved organically, for example, ecosystems are present in courtyard spaces in unintentional way. Even the supposedly negative environmental features, for example, decaying buildings, can trigger sustainability aesthetics responses. The research has confirmed the importance of new vocabulary for sustainability aesthetics: new language applied for description helps to see the environment differently and to develop empathetic relation with the place. Such sustainability aesthetics analysis could become a part of elaborating maintenance and development guidelines in order not to lose valuable qualities that may lie in such from the first glance undesirable features as re-naturalization and decay in the urban fabric. Moreover, such analysis would allow employing heritage environments that are often partially organically developed, as a source of inspiration for architects and planners.

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Kopsavilkums. Pieaugošā vides apziņa un jaunās dizaina un darbības prasības, kas saistītas ar ilgtspējības mērķu īstenošanu, neizbēgami ietekmē būvniecību, arhitektūru, pilsētbūvniecību un mūsu apbūvētās vides attīstību kopumā. Šī ietekme izpaužas gan arvien efektīvākā būvēto konstrukciju ekoloģiskajā izpildījumā un pieaugošajā saistīto tehnoloģiju klāstā, gan šo videi draudzīgo dizainu estētiskajā izteiksmē. Ilgtspējības koncepcijas un vērtību estētiskā izpausme dažkārt tiek saukta par ilgtspējības estētiku. Pētījuma mērķis ir izstrādāt un pārbaudīt metodisko ietvaru, lai raksturotu apbūvētās vides ilgtspējības estētiku.

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Historical traditions and cultural and economic tenability of the modern landscape design of the Residence of Bukovinian and Dalmatian Metropolitans

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Abstract. The article is devoted to the analysis of the history of creation of the Residence of Bukovinian and Dalmatian Metropolitans in the city of Chernivtsi, where the Yurii Fedkovych Chernivtsi National University is now located. A part of this ensemble is a park, the uniqueness of which is due to the combination of three types of parks at the same time – the Italian garden, the French regular park and the English landscape park. The periods of creation of the park, participation of landscape designers and clergymen are covered in detail, landscape techniques and their correspondence to the three above-mentioned types of parks are analyzed. The range of problems of the park's existence and measures for its arrangement are described. Proposals for the creation of a unique Bible garden with the symbolic meaning of landscape sceneries are described separately. The proposed measures are substantiated in terms of creating a new tourist attraction.

Keywords: Residence of the Metropolitans of Bukovyna and Dalmatia, historical traditions, restoration, modern landscape design, Bible Garden

Introduction

The purpose of the article is to identify historical traditions and formulate the principles of landscape design, as well as justify their integration into modern solutions in implementing the strategy of sustainable development of new landscape sites (Biblical Garden) and rehabilitation of historic park areas of the unique ensemble of the Residence of Bukovinian and Dalmatian Metropolitans (hereinafter – the Residence) in Chernivtsi, where the Yurii Fedkovych Chernivtsi National University is now located). In 2011, at the 35th session of the UNESCO World Heritage Committee (hereinafter referred to as the UNESCO WHC), the Residence of Bukovinian and Dalmatian Metropolitans was included in the UNESCO World Heritage List and became the third Ukrainian cultural heritage site. Since 1963 the park and park structures are the monuments of national importance.

The study used scientific methods: graphical-and-analytical, historical analysis, inductive. The methods of historical allegory (based on Bible) and experimental design were used in the design of new sites.

The unique ensemble of the Residence covers an area of 8 hectares, which houses the Metropolitans' Palace, two "outbuildings", ancillary buildings with courtyards, as well as a unique landscape park, the planning structure of which became the subject of this study.

The landscape park is located in the northern part of the site and occupies most of the entire ensemble territory (80 %). It continued the widespread traditions of historicism era parks, which in turn are inherited from the traditions of parks and gardens of previous eras: it is worth mentioning that for centuries parks and gardens have been a significant element of monarchical and aristocratic residences and even church ensembles. If we talk about the importance and image of parks at the residences of the clergy and secular authorities, the period of formation of the landscape design foundations should be called the Renaissance, and in later centuries these traditions improved, developed and changed in relation to changing tastes of society.

The landscape park of the Residence was laid after the completion of the construction of the main buildings in 1876–1878. There are up to two thousand trees and shrubs of 85 species, of which coniferous evergreens are 30 %.

For all the uniqueness of the ensemble as a whole, let us pay attention to the continuity of monastic traditions of landscape design, because since the appearance of monasteries as separate architectural complexes, the garden has become an integral part of them as a personification of paradise for solitude, prayer or religious discussions. The monastery garden was never intended for the general public.

It should be noted here that such traditions were not unique to the gardens of Christian monasteries – both Orthodox and Catholic. The monastic gardens of the Eastern religions – Taoism, Shinto, Buddhism – were also intended for meditation, solitude and inner concentration and were closed to the general public. In Orthodox gardens, the names of landscape sceneries were allusions to biblical names – for

example, Sinai, Eleon, Cedar Stream in the garden of the Feofaniivska Heritage. The personification of the Zen Buddhist philosophy of Japan became the so-called "dry gardens", or "rock gardens", aimed at solitude and meditation. This indicates that, despite the differences in beliefs, there was a commonality between different religions in the separation of sacred territory from secular life, and the garden was an integral part of the sacred territory, and therefore also the bearer of sacred functions. In particular, the separation of what was secular from what was "sacrum territory", as he calls it, said the famous Polish researcher Piotr Gryglewski, noting that the line of walls separated the two spaces as a symbolic spiritual boundary of another world.

Matherials and Methods

The chronological boundaries of the study cover the period from the end of the 19th century to the present. The author's research began during the preparation of a nomination dossier for the inclusion of the architectural ensemble of the Residence of Bukovinian and Dalmatian Metropolitans in the UNESCO World Heritage List in 2009.

The specifics of the research tasks led to the choice of certain scientific research methods. The graphical-and-analytical method was used in the implementation of field surveys and photo-fixation and processing of archival sources and iconographic materials.

Archival and historical sources were used for the research. The basic for the study were archival materials, which are published for the first time and were processed by the authors – these are primarily archival documents of the State Archives of Chernivtsi region [24; 25].

Since some features of the Residence Park are allusions to the eastern gardens, which also took place in the inherited English parks, Chinese sources on the canons of traditional Chinese gardens have been studied [3; 9; 11; 17; 18; 19].

As the authors compare some manifestations with the manifestations of oriental landscape design in the period of spread of the Chinoiserie style in Europe, scientometric sources of modern international teams of scientists studying the traditions of landscape design in the East – articles by Yu. Ivashko, D. Chernyshev, P. Chang [4], Yu. Ivashko, D. Kuśnierz-Krupa, P. Chang [5], Yu. Ivashko, T. Kuzmenko, S. Li, P. Chang [6], Yu. Ivashko, P. Chang, A. Dmytrenko, T. Kozłowski, D. Mykhailovskyi [7], Yu. Ivashko, P. Chang, P. Zueva, Y. Ding, T. Kuzmenko [8], M. Orlenko, Yu. Ivashko, M. Dyomin, A. Dmytrenko, P. Chang [15], M. Orlenko, Yu. Ivashko, P. Chang, Y. Ding, M. Krupa, K. Kuśnierz, I.G. Sandu [16], M. Żychowska, Yu. Ivashko, P. Chang A. Dmytrenko, N. Kulichenko, X.M. Zhang [26].

Landscape traditions of Japan were studied according to the monographs of N. Nikolaeva [13; 14] and the Ph.D. thesis of S. Mostovoy [12]. Elaboration of the relevant source base allowed to cover more comprehensively the landscape features of the unique park of the Residence in Chernivtsi and to determine the range of issues that need to be studied.

The method of historical analysis allowed us to trace the history and stages of development of the landscape park at the Residence, the peculiarities of figurative perception, and so on.

Graphic materials for the planning of Renaissance gardens, Baroque and English parks were used as source material in the historical analysis.

Using the inductive method, the constituent elements of park planning and the degree of influence of narratives of European garden architecture on the creation of planning and compositional structure of the landscape park of the Residence of the Metropolitans of Bukovina and Dalmatia were studied. The works of P. Cornaglia, M. Ferrari [2], V. Gostev, M. Yuskevich, D. Likhachev [10], L. Rubtsov [20; 21], O. Mykhailyshyn were used as a source base.

The researches of Chernivtsi scientists S. Rudenko, O. Ivasiuk, S. Kostyshyn, M. Shcherban, devoted to the plants of the Holy Scripture [22], were used in designing the area for landscape planning of the biblical garden by the method of experimental design. The work by G. Biger and N. Livshitz on plants characteristic of Israel was also used [1].

The applied research methods allowed to investigate the historical narrative of the formation of the landscape park and to create an evidence base for the obtained scientific conclusions and results of experimental design.

Results and Discusson

History of the Residence Park creation

As mentioned above, the landscape park of the Residence was founded in 1876–1878 under the direction of Martin Wilhelm, a senior engineer of the Imperial-Royal Regional Administration. Documentary evidence of his direct involvement in the planning of the park is the "Consistory Extract on the activities of senior engineer Martin Wilhelm on the construction of the Metropolitans' Residence" of October 18, 1880 [24], which states that Martin Wilhelm worked on the building committee for the construction of the Residence for 15 years. He became a member of this committee by order of Bishop Eugen Hackmann and with the consent of the Imperial-Royal Presidium of the Regional Administration on October 18, 1863.

From this document we learn about his responsibilities as the chief landscape architect, and in 1871– as the administrator of the park construction: it is the control of stone and sculpture works, management of works with marble, alabaster,

limestone. It is significant that he retained his leading role even after the dissolution in 1872 of the building committee and building administration and the formation of a new building committee and building inspection under it. In this building inspection, he was listed as a senior engineer, and he was in charge of supervising the construction work. It is noteworthy that due to the illness of Josef Hlávka and the inability of senior engineer Feliks Księżarski to perform the necessary work on his own, senior engineer Martin Wilhelm also took over the artistic direction of the construction of the Residence.

M. Wilhelm headed the building commission to abolish the building committee in 1878 due to the completion of construction work on a number of buildings and the transition to a new stage of construction. His task was also to supervise the completion of certain construction works.

The period of liquidation of the next building committee coincided with the formation of the building inspection for construction and other works in the park of the Residence: drawing up plans, estimates, warranty acts, etc. In this commission, senior engineer M. Wilhelm was appointed responsible for all technical issues.

His activities during this period covered a wide range of tasks, including, in addition to event management, direct development of cost-effective projects for planning the garden of the Residence, gardener's house, greenhouse, outbuildings at the Residence (laundry, wood warehouse, poultry yard and chicken coop, bath, cellar). M. Wilhelm worked not only as a landscape architect, engaged in design work on the ensemble in general, including the layout of the courtyard, the territory of the House Church (chapel), the House for visitors, and also developed engineering schemes for all buildings – external and internal water supply and sewerage networks. Thus, it can be argued that the ensemble of the Residence was not only impressive in terms of appearance or landscaping of the park at the residence, but also in terms of engineering equipment as at that time, because then not all buildings had water supply and sewerage.

Information about the participation of Martin Wilhelm in the planning of the landscape park and the whole ensemble is documented. In particular, the following was reported. "In 1874, F. Księżarski (who at that time was in charge of architectural construction instead of J. Hlávka) was transferred to the National Administration of Galicia in Lviv. Engineer Martin Wilhelm was in charge of completing the work at the Residence…" An excerpt from the Consistory's Report on the Activities of Senior Engineer M. Wilhelm on the Construction of the Metropolitan's Residence of October 18, 1880 states: "... M. Wilhelm, a senior engineer, took an active part in the construction for 15 years."

Traditionally, the bishops themselves took part in the planning of the territories of the residences of the higher clergy, including the gardens and parks at the residences, and the Residence in Chernivtsi was no exception. From archival documents it follows that an active role in the landscaping of the park was played by Bishop Eugen Hackmann: "... the buildings of the Seminary and economic territories should be fenced off from the front yard, and the garden, instead of the designed light fence, should be surrounded by a deaf fence" [25]. His proposal was approved at a meeting of the section of the Ministry of Religion and Education in July 1871, and according to it, senior engineer Martin Wilhelm drew up design documentation for the construction of the fence wall of the Residence Park. He supervised the construction of the wall, 3 meters high.

The function of the fence is not limited to protection, its inner part has a much lower height due to the fact that the fence also restrains the volume of soil, which creates a difference from the top of Dominic Hill to the level of the surrounding sidewalk, i.e. plays the role of retaining wall (the difference in the marks of the earth's surface is from 20 cm to 2 meters in different parts of the wall).

However, despite the prominent role of Martin Wilhelm in the planning of the ensemble of the Residence in general and the landscape park in particular, there were other landscape architects who made their own efforts to create the park. Among the authors of the landscaping of the Residence of Bukovinian and Dalmatian Metropolitans Park are the names of gardeners Victor Pauli and Herman Langer.

In the final version, the area of the park was 4 hectares. The unique park is located on the north side of the palace and closes the main longitudinal axis of the architectural ensemble of the residence. In the very principles of planning we see the common features with the monastery gardens in the Kyiv-Pechersk Lavra or Mharsky monastery, which, although completely different in the organization of green space and planned by the monks themselves, not specialized professionals, but were also isolated from the surrounding "secular" space with a deaf stone fence, up to 3 meters high. We observe the same in the case of the Residence Park, where, in fact, the ancient monastic principle of separating the sacred territory from the secular territory, i.e. the city streets, is embodied. This indicates that, despite changes in the architectural and landscape traditions of monastic ensembles and residences of the higher clergy, they partially preserved the ancient principle of isolation of the sacred territory.

The second similarity between the park in the Residence and the ancient gardens at the monasteries and hermitages is the use of accent forms of relief for its creation – steep banks of rivers, hills, slopes, etc.

Fig. 1. Bust of architect J. Hlávka on the territory of the landscape park [photo by Yu. Balaniuk]

A large park of the Feofaniivska Hermitage was created according to this principle, the gardens of the Kyiv-Pechersk Lavra are located on the edge of the high right bank of the Dnipro, and the Park of the Residence in Chernivtsi is located on the highest part of Dominic Hill. Suffice it to say that the difference in planning marks on the height of the relief from the metropolitan palace to the center of the park is 7 meters, and there is an assumption that this difference in relief was artificially created for better composition of the park. Thus, we come to the conclusion that in ancient times when arranging gardens at monasteries and residences of metropolitans used existing accent forms of natural relief, while in the 19th century such relief could be created artificially to enhance the image of the garden.

By the way, such techniques have been used by many peoples. Suffice it to say that the relief played an accentuating role in the ancient oriental gardens – Chinese and Japanese, where artificially created small copies of real mountain landscapes. In Chinese landscape design, a specific term "urban mountains and groves" was even formed, and in the case when the garden area was flat, artificial hills were added.

Landscape characteristics of the Residence Park

Compared to the traditional layout of monastic gardens of previous centuries, the park of the Residence of Bukovinian and Dalmatian Metropolitans was a work of professional landscape design, as it was created not by the monks themselves, but by specialists, so it combined the achievements of three most prominent European schools Renaissance, regular parks and gardens of the period of absolutism and English landscape gardens and parks of the so-called "free" planning. Taken together, this testifies to the gradual evolution of the so-called Orthodox sacred garden, which gradually absorbed, along with local monastic traditions, the best features of European gardens and parks, including secular ones, at monarchical residences.

Thus, the park at the Residence has features of three styles of garden and park landscape design: Italian style, French style and English style, where the most pronounced features of the Italian garden and English park.

We will analyze the main features of Italian, French and English styles and their embodiment in the landscape paintings of the Residence Park.

The Italian landscape has the following main features:

- continuity of traditions with ancient Roman private gardens, which consists in regular planning with clear geometric shapes, straight, stone-paved paths and the location in the center of the garden pond of the regular geometric shape with a beautiful fountain;
- relatively small, compared to the flat parks of France, a garden or park near the house;
- separation of the garden (park) by a stone wall or a trimmed hedge;
- the regular geometric outlines of flower beds (oval, circle, square) are planted according to certain drawings, where a low-cut box trees (*Buxus sempervirens*) is often used as a border;
- combination of ground plants and plants in pots or containers made of terracotta, in large tubs at the stairs connecting the terraces;
- formation of tree crowns and shrubs in the form of a cube or ball, an ancient column, an exotic bird;
- presence of sculptures at the fountain, pond, grotto, flower beds;
- use of properties of a garden on an active relief by creation of terraces, erection of retaining walls for the maintenance of soil, the device of the beautiful stairs connecting separate zones of a garden.

Signs of the Italian garden are embodied in the entrance to the palace area of the Residence Park as follows:

- this part of the park following Italian tradition opens under the walls of the palace, from the balcony of the northern facade of the Metropolitan's palace, or from the windows of a spacious gallery on the first floor;
- this part of the park has a regular layout with a symmetrical arrangement in relation to the longitudinal planning axis of the two fountains;
- pebble paths used;
- the traditional principles of flower beds are applied – flower beds and a terrace with the dome of a well wrapped with wisteria and a stone ladder with garden vases under arches of braided roses to the top of park;
- relief and tracing of paths are solved in the form of symmetrical oval "fused" forms (according to the Italian tradition of placing the sculpture in the center of the flower bed in 1937 in the center of this planning composition of the park a bust of the author of the architectural ensemble of the Residence of Bukovinian and Dalmatian Metropolitans – Josef Hlávka, was built (sculptor A. Severin) (Fig.1).

Fig. 2. Central alley and gate of the main entrance [photo by I. Korotun]

Fig. 3. Fragment of the front yard layout [photo by I. Korotun]

Fig. 4. Bosquet on the territory of the front yard [photo by I. Korotun]

Fig. 5. Flower bed of perennials [photo by I. Korotun]

Fig. 6. Spatial landscape composition: box tree, yew, thuja [photo by I. Korotun]

The French landscape has the following main features:

- presence of the front yard-coutr of honor of the Baroque period (Tuileries, Marley, Versailles parks);
- strict symmetry in planning, circular elements;
- straight wide alleys, strict bosquets of cut trees and shrubs, carpet flower beds that decorate the ground lawns;
- large parterre spaces emphasize the supremacy and architecture of the palace, the dominance of the main compositional axis with the disclosure of long-distance perspective.

The features of the French garden are embodied in the Residence Park as follows:

- the main axis of the main courtyard of the Residence divides its courtyard into two symmetrical parts, limited in space, which end with wings on the right and left sides;
- the Baroque era technique used to extend the axis at the expense of the street to visually reveal the architecture on the remote approaches to it: the axis is a continuation of the Resydentsii Street (now – Universytetska Street), which increases its length by 300 meters;
- technique of visual completion of the axis by an element of the palace: the spatial completion of the central axis is the majestic portal of the Palace of the Residence;
- location on the main axis not only of the central palace, but also the park located further and thus association of an ensemble compositionally and meaningfully;
- in the center of the courtyard there is an alley of the bishop's procession, covered with small pebbles and lined on both sides with white umbrella acacias of spherical shape (Fig. 2);
- use the principle of lining the ground lawns with box trees with accentuation of yew trees, which retain the bright green color of the crown throughout the year;
- use the principle of bright accent combination of opposite colors to enhance the saturation of each

of them (emerald color of the crown of thuja and red brick walls of the buildings surrounding the yard, two tracks located along it are paved with red sandstone (now partially replaced)); pebble stones also used to cover the rest of the paths: to the seminary building and the Church of the Three Saints, side in front of the Metropolitan's Palace;

- side paths in front of the main entrance to the Palace create a circle in the plan (in the palaces of monarchs – for the reversals of horse-drawn carriages, but since the arrival of horses on the front yard never took place, it performs purely decorative functions in the Residence, Fig. 3);
- use of bright flowers, artificially formed bosquets and bushes with molded crowns (the centers of bosquets are accentuated by saucer magnolia (*Magnolia × soulangeana*), Fig. 4, the inner concentric segments of the circle form rows of globular bushes of red weaving rose on metal frames and yucca bushes – evergreen plants red roses, Fig. 5);
- creation of the parterres adjoining to a geometrical circle and the central tract from the figured planned grass lawns upholstered by the cut box trees (*Buxus sempervirens*);
- distribution for landscaping of the front yard of evergreen plants: local species of yew (*Taxus baccota*), box tree and thuja, which fix the lawns corners of the ground floor pattern. The dark emerald color of these plants brightly emphasizes the red color of the facades of all buildings surrounding the yard at all times of the year because it is known that red and green colors in combination mutually emphasize the sound of each other (Fig. 6).

The central paths have a firm covering from stone plates. For landscaping the cloister of the Seminary Building used ordinary planting of thuja, which has reached a significant age and provides shade in summer.

The English, or landscape, park has the following main features:

- based on the ideology formulated by philosophers, artists and writers and spread in England in 1710–1730;
- participation of artists in the development of the landscape park concepts, in particular the landscape painter William Kent, who during 1725–1735 laid several gardens, which immediately gained great popularity in England, including the most successful Darmer Park. Its concept of a landscape park is a park on an active relief with the most "natural" character of picturesquely located separate groups from trees and bushes and the considerable areas of green lawns;
- participation of gardeners in the creation of the landscape park concept, in particular Lancelot Brown, who introduced in the planning of smooth lines, park ponds with natural outlines of the shores;
- the influence of Chinese landscape design traditions, in particular the fashion for Chinese gardens, which spread through the theoretical work of the director of the Royal Botanic Gardens Kew William Chambers, which led to the enrichment of parks with caves, grottoes, picturesque ruins;
- lack of continuity with the landscape traditions of previous centuries;
- the symbolism of the English park as the personification of the free development of the individual, where serpentine paths and streams meant free expression of thought, belief and action, fidelity to nature in morality and politics;
- political symbolism of the park: the Whig party as the first source of the landscape garden, the philosophy of rationalism – the second;
- availability of green lawns with pastures for wild and domestic animals and recreation areas;
- antagonism of natural disorder in relation to. correct and symmetrically strict forms of the French regular park, where all nature is subject to artificial frames of geometric shapes.

Signs of the English garden are embodied around the perimeter of the Residence Park as follows:

- directly near the wall with a fairly dense ring in 3–4 rows with a bandwidth of 20 meters are groups of endemic trees (beech, hornbeam, oak, linden, maple), which create a barrier to northwest winds;
- arranged grotto and pond-elliptical pond with a bottom in the form of a bowl, up to 1.5 meters deep, with a fountain-slide, typical of European dendrological parks, with one stream, 1 meter above the water surface in the center of the reservoir and a waterfall from the north-east side.

If we compare the ratio of "Italian" and "English" parts, the part of free planning prevails in the general territory of the arboretum (freely delineated park alleys with a classic peripheral bypass).

When planning the Residence Park, these two stylistically different parts of the park are visually separated: the English part, based on rethinking the English traditions of the landscape park, starts right behind the Italian garden: behind the terrace with stairs, 1.5 meters high, a local alley leads to a decorative pond.

It is no coincidence that we constantly compare European and Eastern landscape traditions, as China in the period of the Chinoiserie style and Japan in the period of historicism and modernism directly influenced the trends of contemporary European landscape design. In particular, in the Residence Park, the pond in the English part was previously stocked with ornamental goldfish,

Fig.7. Grotto on the territory of the landscape park [photo by I. Korotun]

a species of Chinese silver carp (*Carassius auratus gibelio*), many species of which were exported to Europe from China, bright red-gold, yellow and pink colors and one of the most beautiful aquarium fish – veiltails, which were bred in Japan more than 400 years ago.

The pond was planted with algae that grew in special boxes installed on the bottom and water lilies of several varieties. The influence of the gardens of China and Japan is also felt in these landscaping techniques. Such an influence can be considered the arrangement on the southern shore of the reservoir, with park benches around, a small waterfall flowing from the wreckage of an ancient vase.

The combination of a quiet splash of water, smooth movements of bright fish in the water and the rustle of tree leaves provided a silent communication with nature, which in China and Japan was considered the highest embodiment of beauty and harmony. If we mention the atmosphere of Chinese and Japanese gardens, then traditionally Chinese gardens were considered gardens for pleasure, and more ascetic Japanese – for solitude, introspection, inner improvement and knowledge of perfect harmony in simplicity. From this point of view, the Park of the Residence is still closer to the philosophy of the Chinese garden than to Japan, because it has a large number of components and accents.

The pond is surrounded by weeping willows, surrounded by saucer magnolias (*Magnolia* × *soulangeana*) with bright purple-red on the outside and white petals on the inside, the flowers of which are somewhat reminiscent of the sacred Buddhist lotuses, and catalpas. From here, alleys with asymmetrical planting of trees, open lawns, cozy baskets diverge in different directions.

At the same time, the park at the Residence not only repeats the traditions of Italian gardens and English landscape parks, but is also an allusion to the local Bukovinian landscapes: in particular, the shady northeastern part of the park resembles natural Bukovinian forest (Fig.7). We can say that different parts of the park create a different mood – contemplation of bright Chinese fish – peace and harmony (here we can recall that in China on the shores of reservoirs were built traditional gazebos for fish watching – such gazebos are in the traditional gardens of Suzhou, registered UNESCO World Heritage Site), staying in the "forest" northeastern part of the park – a feeling of tension and concentration, anticipation of the unexpected. So, thanks to the skill of gardeners, a person during a walk in the park can get a lot of impressions and mood swings. And again, the main principle of the traditional Chinese garden is remembered – it is a constant change of landscape sceneries and hence the mood as the embodiment of the cycle of phenomena in the Universe and seasonality. Such constant allusions to the eastern garden during the analysis of landscape paintings of the English garden are another proof of the organic inclusion of the eastern component.

An important place in the organization of the Residence Park was played by careful selection of trees and plants to create landscape paintings, in arranging crowns in shape (mien), shades of green, as well as color and shape of leaves (large, up to 40 cm, medium 10 – 20 cm, small – up to 10 cm).

The picturesque nature of landscape paintings is achieved due to the selected combination of trees and plants with small garden and park architectural forms, including: fountains, ponds, grottoes, benches, as well as with the outlines and originally ceramic crumb covered paths (now the paths are paved). The selection of the historical type of pavement was conditioned by the fact that ceramic crumb created a unique red color of the paths, which accentuated the pastel greenery of the spring park, emerald greenery of the park in summer and bright yellow leaves in autumn.

To form the plant compositions of the park, trees with monopodial and sympodial branching were taken, the seasonality of flowering of spring and summer species, as well as the duration of flowering were also taken into account. This also shows a direct allusion to Chinese gardens, where landscape pictures of a certain seasonality were immediately conceived, some plants bloomed in spring, some in summer, and there were also evergreen areas.

The influence of landscape traditions of China and Japan can be considered the fascination with the tradition of landscaping parks with exotic trees: for example, the central part of the Residence Park is decorated with exotic plants that appeared on the European continent only in the eighteenth century:

southern catalpa (*Catalpa bignonioides*), tulip tree (*Liriodendron tulipifera*), western thuja, originating from Eastern Canada and the eastern states of the USA (*Thuja occidentalis*), ash maple, or negundo, American maple (*Aser negundo – Negundo fraxinifoliym*), Canadian hemlock (*Tsuga canadensis*) as Chinese large-flowered magnolia (*Magnolia denudata*), different types of flowering shrubs: mock-orange *(Philadelphus L.),* deutzia (*Deutzia L.),* meadowsweets (*Spiraea japonica*), tamarisk (*Tamarix L.),* forsythia (*Forsythia suspensa)*, *spiraea vanhouttei*, Osage orange (*Maclura pomifera*), yellow azalea (*Rhododendron luteum*). Sunny meadows are decorated with ornamental trees of endemic species: 100-year-old red-leaved beech (*Fagaseae*), Western European larch (*Larix desidia*), red oak, chestnut.

Amazing "accent" amazing trees were also artificially formed, such as a "tripod" apple tree, created in such a way that the crown of the tree was grafted on two neighboring rootstocks at once.

At one time in the middle of the twentieth century in the park of the Residence walked roe deer, today there are squirrels and birds.

The peculiarity of the green zone of the park was that here on the border of the park and the economic zone of the guest building there was a seed and agricultural laboratory, where the population could get advice on agriculture and horticulture, in particular to check seed germination and soil chemical composition and learn about ways to enhance its fertility.

Modern problems
of the Residence Park existence

The main problems of today, related to the functioning and condition of the park at the Residence, are as follows. First of all, this is a respectable age, and hence the emergency condition of many trees that need to be replaced. Old trees get sick and are affected by mistletoe, which requires periodic sanitation. Instead of removed trees, seedlings of similar species are planted (except for self-seeded trees that grew during the Soviet era).

When the function of the ensemble of the Residence changed, part of the farmsteads ceased to be used for its original purpose, in particular, the courtyard adjacent to the west wing of the Metropolitan Palace was used for some time as a training ground for the Department of military training.

Now the territory of this yard is tidy, has a grass lawn instead of the removed asphalt, and on October 4, 2013 on the territory the ceremony of laying of the Bible garden took place.

The once important Eastern Upper Courtyard, adjacent to the opposite, eastern side of the Metropolitan's Palace, where on July 8, 1864 (the day after the consecration of the Cathedral of the Holy Spirit in Chernivtsi) a solemn crowded ceremony took place during which Bishop Eugen Hackmann laid the foundation of the House Church (chapel) of St. John of Suceava, which marked the beginning of the construction of the complex of the Metropolitan Residence in Chernivtsi, until 2020 was a cluttered area [18, *137*], which is now partially streamlined.

The eastern "Lower Yard", intended for servicing the House for Visitors, adjoins the Upper Yard on the south side and is separated from it by a stone fence – a retaining wall was also disordered until 2020, although there are archival drawings showing the space and buildings of this yard. The process of revalorisation of its space is underway.

Due to the disorder of the Residence as a tourist attraction during the consideration of the inclusion of the Residence in the UNESCO List at the 35th session of the UNESCO WHC, several remarks were made, the main one being the lack of tourist infrastructure on the territory of the nominated object, it was noted the compliance of the nomination dossier of the Residence, in particular the management plan, the criteria of the Operational Guidelines for the implementation of the "Convention for the Protection of World Cultural and Natural Heritage", about the inconsistency of functioning within the territory of the Residence architectural ensemble the garage workshops, sheds and warehouses of late stratification (1970s), which have no historical value and are not authentic, of the utility yard, the presence of which does not correspond to and its qualities do not attract, but, on the contrary, repel tourists.

In particular, this was stated in the conclusions of the ICOMOS international expert Mr. Josef Stultz, who in 2010 (during the nomination of the site) on behalf of the UNESCO World Heritage Center, visited the Residence with an expert mission.

The economic crisis has not allowed the university to fully eliminate all the comments made in previous years, they managed to take into account only partially. Management plans of the Residence as a UNESCO World Heritage Site (2011–2015) and an existing site (2015–2020) were prepared, and the issue of creating an appropriate tourist infrastructure based on it was raised. The main remark concerned the removal of the economic function of the yard and its replacement by tourist infrastructure.

The difficulty was the need to move to other areas of commercial and technical premises, but this was the main remark of the UNESCO World Heritage Center and the monitoring mission of the UNESCO World Heritage Center (Paris), the UNESCO Site Management Center (in operation at the university since 2012). As a result of the proposal of the UNESCO Facility Management Center, together with the university management, a collegial decision was made to bring the utility yard to the territory of other educational buildings.

Thus, measures are implemented for the reconstruction of the utility yard, buildings and ancillary facilities: warehouse and garage-workshop with a change of function and implemented plans to create in their place components of the tourist infrastructure.

Project stages

Scientists of Yurii Fedkovych Chernivtsi National University together with the Center for Management of UNESCO, began work on a comprehensive scientific survey and preparation of design documentation, which is divided into two stages.

During the first stage of works complex scientific works were carried out, in particular researches, photofixation, definition of cultural, historical and scientific value of economic constructions, late extensions and layers were revealed, works on photofixation, measurements, creation of sketch proposals, etc. were carried out. It is planned to remove technical means, trucks and cars, dismantle (demolition) of late and dissonant buildings and structures, initial (preliminary) improvement of the territory and construction of public toilets on the site of two existing warehouses.

At the second stage it is planned to reconstruct the building of the workshop-garage for the object of tourist infrastructure: cafe, kiosks for souvenirs, tourist center; as well as the implementation of landscape transformation of the yard. During 2020-21, design and estimate documentation was prepared. The process of its approval and examination lasted until 2021. Currently, the program of the President of Ukraine "Great Restoration" provides funding for the work.

In October 2013, at the initiative of the Yurii Fedkovych Chernivtsi National University, the National Jewish Fund (*Keren Kayemet LeYisrael*) (which plans to finance the creation of the Bible Garden), the Embassy of the State of Israel in Ukraine at the Residence of Bukovinian and Dalmatian Metropolitans as part of the Year of the State of Israel in Ukraine, a solemn ceremony of laying the first Bible Garden in Ukraine took place. The distinguished guests solemnly planted the first tree seedlings brought from Israel. These seedlings are symbols of memory of relatives and friends.

On the basis of Yurii Fedkovych Chernivtsi National University by order of the rector – Professor, Doctor of Physical and Mathematical Sciences S.V. Melnychuk, – a working group was established to develop a program to create a Bible Garden and coordinate the stages of planning, communication with international organizations and funds.

The list of plants and trees in the Bible Garden was created according to the list in the book "Plants of the Holy Scripture" (2010) by authors – scientists of Yurii Fedkovych Chernivtsi National University –S. Kostyshyn, S. Rudenko and M. Shcherban in co-authorship with employee of the M.M. Gryshko National Botanical Garden T. Schepytska.

In particular, the research team managed to create a catalog of plants of the Holy Scriptures suitable for the climatic zone of Chernivtsi.

The next stage of pre-project development according to the Law of Ukraine "On Protection of Cultural Heritage" included a survey of the territory

Fig. 8. The territory where the Bible Garden is planned to be created [photo by I. Korotun]

and technical condition of the buildings and structures located on it. The works were funded by Yurii Fedkovych Chernivtsi National University and performed by the Ukrainian Specialized Research and Restoration Institute "UkrZakhidProektRestavratsiia" in 2012.

The author's team of Yurii Fedkovych Chernivtsi National University teachers under the leadership of I. Korotun developed a sketch project of the Bible Garden. According to the project, the existing gate defines the main visual axis of the garden. The territory of the garden is organized taking into account the simultaneous performance of three functions – education and training of students, excursions and recreation (because the Residence is a prominent tourist attraction), aesthetic and artistic function. According to the proposed conceptual idea of the architectural and planning solution of the Bible Garden in the landscape by means of architectural and landscape techniques, relief, plants (as the main component) embodies the Law of Moses, which forms the first part of the Tanakh – Torah and the first five books of the canonical Bible.

The size of the garden is quite small and is 70 x 83 meters in a rectangular part (Fig.8). The terrain between the two buildings of the Residence, the street separated by a stone fence, and the old park behind a brick wall is quite calm with a slope to the southeast, the total area of the garden is 6165 m^2. The authors of the concept identified the main factors that influenced the planning structure and determined the main front of the perception of the Bible Garden. The tourist function was defined as the main one, therefore, the garden space should be organized in order to maximize the saturation of the exposition on a relatively small area by means of a certain route of alleys and paths with constantly changing angles and fronts of visual perception and filling with dendrology according to the technical task. In the entrance area with a total area of 900 m^2, the main information and communication node is formed for the accumulation of visitors. Planning means provide for the division of the territory into 5 sectors.

Sector 1. Dedicated to *Bereshit* – the Book of Genesis, the first book of the Torah, the Old Testament and the entire Bible. It consists of two departments:

A) Creation of the world and all living things, as well as the creation of the first people – Adam and Eve (Chava), the first sin (fall), expulsion from the Garden of Eden.

B) The history of the Flood, the twelve tribes of Israel, the life of Joseph in Egypt and ends with the resettlement of Jacob's family to Egypt.

Sector 2. Dedicated to *Shemōt* – the Book of Exodus, which tells the story of the Exodus of the people of Israel from Egypt under the leadership of Moses (Moshe). Giving the Torah to the Jewish people on Mount Sinai, wandering in the wilderness.

Sector 3. The third book: *Vayikra* – The Book of Leviticus – is devoted mainly to the priestly legislation and temple services, the laws of spiritual purity and impurity, including laws of Kashrut, Yom Kippur (Doomsday), etc.

Sector 4. *Bemidbar* – the Book of Numbers describes 40 years of wandering in the wilderness before Israel entered the Land of victory over neighboring nations, access to the borders of Canaan, where the land flows "with milk and honey."

Sector 5. Deuteronomy – *Dvarim*, instructions and prophecies to the sons of Israel for all subsequent generations.

In the right part, the site master plan provides the elements of green spaces and landscaping: paving, small architectural forms, vertical planning of the territory. Each of the above sectors corresponds to a specific set of plants. The main visual axis ends with the "Garden of Eden", the direction is fixed by the berceau, above which are collected curly roses, mostly of light shades. The territory of the 2nd sector of the Book of Genesis is also framed in the form of a circle. In its center is the "Oak of Mamre", the passages are organized around the ring. From the side of the street there is a berceau, in the form of the Noah's ship skeleton. Berso is a frame for climbing plants and at the same time – closes part of the visual front on Nekrasova Street. In the course of movement, the relief gradually artificially lowers and reaches the lowest mark in the "Exodus" part, where an artificial reservoir is located, symbolizing the Nile River. In the waters of the reservoir there are molds for reeds and a wicker reed cradle, which is reminiscent of the story of the birth of Moses. The back side of the reservoir, facing the park fence, is formed in the form of two walls-waterfalls that flank the path. This is a symbol of the crossing of the people of Israel through the Red Sea, "marching across the sea, as if on dry land, seeing the pharaoh's army being drowned." The next point is the artificial mountain – the symbol of Mount Sinai. Climbing 50 steps, we find ourselves on a small plateau – an observation deck. The slopes of "Sinai" are open to sunlight and provide a convenient opportunity for planting various herbaceous plants and shrubs (hyssop, tamarisk – a symbol of manna from heaven). At the foot of the mountain is a desert zone – an open area covered with sand – a striking contrast to the lapidary surfaces of "Mount Sinai". In the lower part of the mountain slope, at the level of the raised hand, a source is arranged – a symbol of the source of Moses. In the inner part of the mountain, there is the possibility of constructing various grottoes, caves, as well as technical rooms for managing utilities (spacious basements of adjacent buildings can also serve for these purposes).

The "Book of Numbers" is located in the immediate vicinity of the Metropolitan's Palace. In the center of the platform is a canopy gazebo, signifying the Tabernacle of the Meeting, which is often mentioned in the book. Also, from this part of the garden, a fence is opened and a connection with the existing park is arranged. The surrounding area is planted with biblical grasses, climbing plants and shrubs.

The symbol of Deuteronomy is the central ground that unites all the other books. The straight path is traced in such a way that it allows you to view all areas at the same time, which symbolically illustrates the content of Deuteronomy.

Thus, on a relatively small area of 0.6 hectares, the content of the Torah is revealed by artistic methods, and a complex harmonized space is formed, which provides opportunities for recreation and sightseeing.

The presented draft design represents a small part of the working drawings, which are to be developed in full.

Priceless treasure of nature and a monument of landscape art of national importance – the park of the architectural ensemble of the Residence of Bukovinian and Dalmatian Metropolitans in Chernivtsi has aged since its inception and somewhat lost its former appearance, but retained the atmosphere of charm and comfort that attracts and city dwellers.

It is hoped that the university management, the Chernivtsi community will make efforts to recreate the enchanting beauty of the Residence Park, that its fountains will start working again, the grotto and the pond will be repaired. After all, this is an invaluable part of the city, part of a site included in the UNESCO World Heritage List.

Conclusions

Taking into account the visual perception of the park, relief, visual axes, habitus and plots of tree shadows, the following main areas have been historically distinguished in the Residence Park: terrace palace territory (Italian garden); a French garden, an area of an English park with a pond and a grotto, an economic part, with a greenhouse and greenhouse facilities and housing for staff in the western part of its territory, separated from the park by a green strip of mighty trees.

Thus, the architectural and planning basis of the structure of the main courtyard and park of the Residence of Bukovinian and Dalmatian Metropolitans

combines the achievements of three most prominent European schools of landscape art: Italian regular Renaissance gardens (Villa d'Este, Tivoli; Boboli Gardens at the Pitti Palace, Florence, gardens in the Vatican courtyards by Bramante), regular parks and gardens of France in the period of absolutism (Versailles, Vaux-le-Vicomte, associated with the name of the famous park master Lenotre) and English landscape gardens and parks of so-called "free" planning.

Previously, the central alley of the main courtyard of the residence on the great religious holidays was a procession, in particular at Easter and Christmas. Now, at the beginning and at the end of the academic year, thousands of students of the Yuri Fedkovych Chernivtsi National University gather here to accept the initiation of freshmen into students and to receive diplomas.

It is also a favorite space for various flash mobs, in particular, for the first time in Ukraine, a celebration of Ukrainian embroidered shirt was held here.

Today, with the work of arranging the old park and starting work on the creation of the Bible Garden, this unique object acquires a modern sound and becomes a tourist attraction.

Due to the fact that the Bible Garden is laid out on the territory of the World Cultural Heritage site, special requirements are imposed on the procedure for the development of documentation and execution of work. The documentation is undergoing the procedure of finalizing the nuances and details and, in accordance with the current legislation of Ukraine and international regulations, will be submitted for preliminary approval at the UNESCO World Heritage Center, at the National Commission of Ukraine for UNESCO and the Ministry of Culture of Ukraine.

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Kopsavilkums. Raksts ir veltīts Bukovīnas un Dalmācijas metropolītu rezidences izveides vēstures analīzei Čerņivcu pilsētā, kur atrodas Jurija Fedkoviča Čerņivci Nacionālā universitāte. Analizētā ansambļa sastāvdaļa ir parks, kura unikalitāte ir saistīta ar trīs veidu parku vienlaikus apvienojumu – itāļu dārzu, franču parasto parku un Anglijas ainavu parku. Detalizēti apskatīti un analizēti parka tapšanas periodi, ainavu arhitektu un garīdznieku līdzdalība, izvērtētas ainavu tehnikas un to atbilstība trim augstākminētajiem parku veidiem. Rakstā aprakstīts parka pastāvēšanas problēmu loks un tā sakārtošanas pasākumi.

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A traditional Japanese garden and its lessons for modern times

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Abstract. The study focuses on the origins and characteristics of traditional Japanese landscape design and its features. A comparative analysis of historical Chinese and Japanese horticultural traditions is carried out, as a result of which it is proved that in both cases the basis was religious syncretism with regional characteristics. A comparative analysis of Chinese and Japanese gardens has shown how, over time, they drifted further and further from each other, the Chinese garden continued to improve its hedonistic orientation, while the Japanese garden followed the path of maximum asceticism, the aesthetics of empty space, symbolism, that is, which helped maximize concentration and self-contemplation.

Keywords: Japanese garden, Chinese garden, influence, features, experience for modernity

Introduction

The most established idea of a traditional Japanese garden is that of the most ascetic "rock garden". However, Japanese landscape design is a much more complex, multifaceted phenomenon, in which Chinese influences are also felt, to analyze the similarities and differences between Chinese and Japanese gardens and show how historical landscape traditions can be useful in modern conditions.

In order to reach this aim, the review of traditional Japanese landscape architecture in comparison with related Chinese garden tradition was carried out; the main features of traditional Japanese landscape architecture were highlighted and their correspondences with contemporary sustainable landscape architecture trends were demonstrated.

An extensive block of publications by Chinese researchers was used, since many European and Russian scientists analyzed the landscape trends of the East from the standpoint of the European mentality and not always reasonably and correctly, respectively, of the Chinese or Japanese mentality.

The following publications in China have become basic: Li Chunqing [21], Wang Yi [42], Pan Jiaping [31], Tong Yu Zhe [37], Zhu Guang Yu [49], Jiang Zhenpeng [17], Xing Yue [44–45], Fang Liqiang [5], Huang Wei [11], Pei Yuansheng [32], Wang Guanglong, Zhang Hangling [41], Lou Qingxi [24], Zhou Weiquan [48], Liu Dunzhen [22], Zhao Guanghua, Qiu Mao [46], Zhu Junzhen [50], Fang Zhirong [6] and others.

Publications of recent years have also been analyzed, many of which are co-authored by European and Chinese scientists: the articles of M. Dyomin, A. Dmytrenko, Yu. Ivashko, M. Orlenko, T. Kuzmenko, D. Chernyshev and the Polish researcher D. Kuśnierz-Krupa [13–15, 29].

Sources for Japan are represented by the works of N. Brunov [3], V. Ovchinnikov [30], H. Shevtsova [36], N. Anarina and Ye. Dyakova [1], N. Vinogradova [40], Ye. Golosova [7–8], M. Ignatieva [12], S. Mostovoy [26], L. Lebedeva [20], N. Nikolaeva [27–28], as well as works of Japanese scientists M. Shigemori and K. Shigemori [35].

The material relevant to contemporary trends of sustainable landscape architecture was analyzed as well including M. Hemmati [10] research on the features of sustainable landscape architecture, the S. Kellert [19], W. Browning et al. [2], N. Salingaros [34] sources related to biophilic design, research related to ecological landscape aesthetics and its perception by M. Dekay [4] and the concept of sustainability aesthetics presented by S. Kagan [18].

Before proceeding to the analysis of the Japanese gardens investigated by the authors, one should turn to the characteristics of the Japanese garden, which N. Brunov cites in his book "Essays on the History of Architecture" [3]. It should be noted that a number of the provisions outlined in this book are, in the opinion of the authors of the article, debatable.

N. Brunov emphasized that the similarities between the landscape design of China and Japan are much more important than the differences [3]. In our opinion, this is undoubtedly true in relation to the philosophical and religious basis on which the landscape design of both China and Japan was formed, since Taoism and Shinto show many similarities in relation to the Universe and nature, the same is true in relation to Buddhism introduced into Japan from China: in China, religious syncretism was formed by three teachings – Taoism, Confucianism and Buddhism, in Japan – two – Shinto and Buddhism. At the same time, in ancient

China, each of the components of religious syncretism played a certain role in this symbiosis – ideological, emotional, or moral and ethical.

Since China had a really strong influence on Japan early, there is indeed a Chinese tradition in Japanese landscape design.

At the same time, a comparison of traditional medieval Chinese and Japanese gardens in terms of landscape techniques, imagery, emotional impression shows how far the Japanese have departed from Chinese traditions. There is no controversy and the thesis about the growth of Japanese art from more ancient Chinese at the early stage of the formation of Japanese art.

The same is true in relation to landscape design. N. Brunov emphasizes that the borrowing was dissolved in the regional peculiarities of Japan, creating its original variations on the basis of the traditions brought in from the outside [3]. Another feature of both Chinese and Japanese architecture and landscape design that he noticed is the inviolability of the canons, the stability of images and the continuity of traditions.

In China and Japan – and this is their commonality – a garden is not just an element of the environment for human relaxation, but an intermediate link between the Universe and nature as carriers of the ideal laws of harmony and a man-made artificial environment of architecture. That is why the garden pavilions seem to merge with the natural environment.

The purpose of this study is to analyze the origins of Japanese landscape design in different historical periods, to trace its relationship with Chinese gardens and regional identity, to identify and list the main landscape techniques and types of gardens. One of the tasks is to analyze the modern gardens of Japan in order to identify continuity and innovation.

Materials and Methods

Since the research topic directly covers the historical, philosophical, religious, and cultural aspects, this led to the use of traditional scientific methods of historical analysis (for the study and study of the historical situation, factors influencing the formation and establishment of sustainable traditions of landscape design) and religious analysis (since the basis of Chinese and Japanese landscape design are philosophical and religious teachings).

The method of comparative analysis was also actively used to compare the landscape traditions of China and Japan and the landscape traditions of different eras, which made it possible to determine their periodization. The method of photographic recording was also used on the basis of P. Zueva's natural survey of the gardens of Japan.

The specificity of the scientific approach to the analysis of the historical landscape design of Japan in connection with the analysis of similar traditions in China required the simultaneous involvement of both sources devoted directly to the culture, architecture and traditions of Japan, and sources on the landscape design of China.

Results and Discussion

The Origins of Japanese Landscape Design: Controversial Positions

Today, there are many scientific sources devoted to the gardens of China and Japan. Based on the analyzed sources and the research conducted, the authors would like to focus on the main characteristics of traditional Japanese gardens and on those points in the literature that, in their opinion, are controversial.

According to the authors, the list of landscape techniques that N. Brunov lists, although it is correct, does not fully reveal all the features of landscape design from the point of view of philosophical and religious content.

In earlier publications of the authors and their co-authors, based on the study and analysis of Chinese sources on landscape design, a system of principles of landscape techniques in China was formulated [13–15]:

- a garden as an image of an ideal world, separated by a wall from the real world, the primacy of nature and the secondary nature of pavilions in the garden;
- the absence of distant perspectives and the division of space into separate landscape paintings, the constant change of which symbolized the ever-changing Universe;
- the semblance of ink landscape painting and similar landscape design techniques;
- the technique of miniaturization of existing natural landscapes (genre "urban mountains and groves");
- the technique of miniaturization of existing natural landscapes (genre "urban mountains and groves");
- the use of techniques "shang-shui" ("mountains-water", a well-known genre of Buddhist ink painting), "one lake – three mountains" (a symbol of three immortals in Taoism who live on the mountains, under which the sea of immortality splashes, the lake is called the sea), "borrowing a landscape" (inclusion of mountains, pagodas, temples located outside the garden into the landscape picture), "garden within a garden" (a small garden with its own wall around it inside a large one), "landscape as a picture in a frame", "division of a landscape";
- poetization in the architectural form and the name of the artificial environment – garden pavilions;
- orientation of all pavilions with the main facades to the south;

- the seasonality of landscape sceneries.

In our opinion, in the book of N. Brunov, a characteristic of a traditional Chinese garden is given from the point of view of a European, in addition, there are still differences between the landscape techniques of China and Japan. If we apply the characteristics given by him to a Chinese garden, then he lists the following signs [3]:

- a river flows through the garden, which is dammed;
- the shores are given pre-planned outlines;
- the pond is intended for boating (this is not always the case);
- a decorative bridge is thrown across the pond;
- there are islands in the pond. The contours of the islands are thought out in advance (in fact, this is subject to the rule "one lake, three mountains", it can be a pond or a lake, where the island with hills symbolizes the Taoist cult of the immortals);
- the forms of trees groups planted in different parts of the garden are also thought out in advance (groups of trees are subordinated to the specific landscape techniques we have formulated above);
- the views into the distance, opening at different points of the garden, were designed by the architect and included in the general compositional design (in relation to the Chinese garden, we have listed these techniques above).

With regard to Chinese and Japanese gardens, Brunov emphasizes the dominance of the curve in forms for maximum natural effect. He notes curvilinearity in such elements:

- the meandering shores of the pond, islands, transitions of stones between them;
- the outlines of groups of trees, picturesquely scattered over the garden;
- all these lines merge with the outlines of mountains in the distance, in which the picturesque curve also dominates;
- the same curved lines dominate the roof of the building;
- the buildings are only a part of the whole picturesque play of the garden and nature.

As the main element of the Chinese and Japanese gardens, N. Brunov singles out the bridge, which forms landscape pictures from different points [3]. The researcher emphasizes the philosophical and religious significance of the bridge, emphasizing that the bridge is an element that concentrates the waters of the dam before the further flow, and, like a bridge, all human emotions and human experiences are concentrated at a single point of reflection on eternal truth and the achievement of ideal harmony.

This view of the structure of the world and the place of man in it is closest to the schools of Buddhism with their denial of momentary human suffering on the way to enlightenment and comprehension of ideal life. It is in this analogy of natural phenomena and human emotions that the visibility of understanding the place of a person in the Universe lies.

In both China and Japan, not only architects, but also philosophers, poets, priests were engaged in landscape design, and it was the latter who brought the philosophy of Taoism, Confucianism and Buddhism into the traditional landscape, gave landscape paintings a hidden sacred meaning. Following China, these traditions appeared and acquired regional features in Japan. In both countries, traditional landscape design expresses the idea of full and maximum fusion with nature and the subordination of architecture to it.

In the early period, the Japanese garden borrowed entirely from ancient Chinese traditions. N. Brunov believes that since the Japanese garden appeared only in the 7th century, it turned out to be better studied than in China (according to some sources, the traditions of Chinese gardening traditions date back 25–30 centuries) [3].

The authors agree with this statement, which they proved when studying the history of garden pavilions in China: the dates of construction of most of the pavilions are unknown, at best, only the period of the dynasty is indicated.

N. Brunov identified three, in his opinion, periods of formation of the traditional Japanese garden [3]:

1) the first period of the VII–XIII centuries.
2) the second period of the XII–XIII centuries.
3) the third period: the second half of the 15th century.

Since in the future we will be based on this periodization, we will give the characteristics of each of these periods formulated by him.

In the first period, the Shinden style and the flourishing of landscape design in the Heian period (794–1185) are distinguished. In the miniaturization of real landscapes characteristic of this time, we can note the influence of the aforementioned Chinese genre "urban mountains and groves". Among the options for artificial islands in the garden of the first period, a mountainous island, a wooded island, an island with fields, an island near the seashore, an island in the shape of a cloud, an island with a sandy shore are named [3].

As you can see, there is a difference from the islands of Chinese gardens in such a list of island types among reservoirs. N. Brunov calls one of the features the types of water fall: contrast, lateral, abrupt, spiral, large mass, thread trickle, double, right and left, oblique. He believes that the main condition is the illumination of the water and the direction of the waterfall to the moon.

It should be noted that our study of Chinese sources on landscape design showed that the

Fig. 1. Byodo-in Buddhist Temple in Uji, near Kyoto. Phoenix Pavilion. Built at the end of the Heian period. The temple garden is built in the Jodo style, or the natural landscape style [photo by Polina Zueva]

methods of water falling in a waterfall are not analyzed in such detail there. For comparison, in the sources you can find references to specific effects in Chinese gardens – sound imitation of wind noise, echoes, birdsong or the noise of a waterfall.

Closer to the authors are the views of the researcher of Japanese architecture, the architect H. Shevtsova, who also calls the origins of Japanese landscape design the Heian era (784–1185) and sees these origins in traditional Shintoism [36, *128*].

Like N. Brunov, she defines the gardens of this period as gardens at villas and monasteries with large lakes for boat trips (the gardens of the Bedo-in (Bedo-in Temple) in Uji (Fig. 1) and Dzeruriji in Kyoto) [36, *128*]. The type of reservoir that reflects the Phoenix Pavilion is curious in its shape and is almost never seen in Japan. The island for such a body of water is extremely large, because Japan is characterized by wide bodies of water with small islands. This type of water body is widespread in China and is ubiquitous in the imperial parks and gardens.

Among the features of the first period of Japanese landscape design N. Brunov named symbolism, naturalism and symbolism of stones, the arrangement of which has a certain meaning [3]. Since the stones were considered alive, with the soul of a deceased hermit monk, they had to have a geometrically irregular shape. In Japan, moss-covered stones were the most prized.

Here it is appropriate to recall the importance of stones in China, where stones of a bizarre shape with holes were most valued: a hole was knocked out in the stone and it was placed in water, the water grinded the hole, thereby giving it features of naturalness.

N. Brunov names the most common types of stones in the gardens of Japan [3]: "turtle head" as a symbol of longevity, guard stone, moon shadow stone, "veil of fog" stone, shadow stone for playing fish, stone gorge with tigers, etc. etc.

And here begins a noticeable difference between the Chinese and Japanese gardens: the Chinese garden is always alive, although the stones play an important semantic role in it, they do not dominate, while in Japan there is a concept of a "dry" garden without trees and shrubs, only of stones. For example, in the treatise of the 15th century architect Seami, there is nothing but stones in an exemplary garden plan. The gaps between the stones are covered with moss, and the stones protect it from walking people, so the stones are located at a distance of a step from each other. If the paths were lined with small stones, inappropriate for walking on them, they did not walk on them, but admired from the pavilion.

Sinden is the main building in a traditional Japanese garden from this period, and the main viewing point for the garden. Gazebos and a boat while walking along the lake are also places of interest.

The second period of the XII–XIII centuries. characterized by significant changes due to numerous inter-clan wars and the spread of Buddhism. It is thanks to Buddhism that such a specific role of the garden as a garden for meditation and self-contemplation manifests itself, that is, this new function of the garden changes the dominance of the garden for recreation and entertainment of the early period. This occurs during the Kamakura period (1185–1333). The bridge in the first period was adapted for a boat to sail under it, the bridge in the second period becomes adapted for walking in meditation, therefore it is built lower. On a pond or lake, people no longer ride boats, clean running water is replaced by standing water overgrown with marsh grass. They simply admire the pond, and all landscape paintings are calculated for perception not from a boat, but in the process of walking. The new orientation of the garden led to new landscape design techniques.

The third significant period for Japanese landscape design N. Brunov calls the 2nd half of the 15th century, when the main gardens are concentrated at Buddhist temples and monasteries [3]. This period is distinguished by the unity of landscape and pictorial prima, which, by the way, was typical for China and embodied in the Buddhist genre "shang-shui" ("mountains-water"). The postulates of Buddhism manifested themselves in landscape design in purity, in space, in the possibility of solitude and meditation. The garden, according to N. Brunov, is located on a hill, from its center to the outskirts the trees are thicker and higher, behind them there are mountains, and thus the garden on the hill merges with untouched nature with a gentle transition. H. Shevtsova also calls a special kind of garden "garden on a hill" (gardens of the Ginkakuji and Kinkakuji temples).

Large gardens also used for a tea ceremony, which was especially important for Buddhism. The semantic center of the "tea" garden is the tea pavilion with a smaller tea garden, separated from both the main massif of the large garden and the rest of the buildings. The flourishing of such tea gardens and the tea ceremony in general is associated with the Tokugawa period (1603–1867). Among the signs of a tea garden, N. Brunov singles out a hut-waiting for an invitation to a tea ceremony. He calls the emperor's summer residence Villa Katsuro in Kyoto (16th century) as a typical example of a garden with a similar layout [3].

Consequently, in both China and Japan, the geometrically correct outline of the pavilions is contrasted with the picturesque natural environment.

Although traditionally the Japanese garden is considered more minimalist in relation to the Chinese garden, N. Brunov emphasizes that along with the ascetic Zen gardens, there were also picturesque secular gardens. He identifies four main types of Japanese gardens [3]:

- "Funa asobi" – "pleasure boat" (gardens of the Heinan era, most often around the houses of noble families with an extensive pond for boating;
- "Shuyu" – "walk" (gardens of the era of Heinan (794–1185), Kamakura (1185–1333) and Muromachi (1333–1568) around houses and temples for viewing from a winding path from which different views open);
- "Kansho" – "contemplation" (stone gardens of Zen Buddhism of the Muromachi period, intended for contemplation from one place, the stones of which cannot have a clearly formulated and expressed in words symbolic meaning, the second name is "dry mountains and waters");
- "Kayu" – "variety of pleasures" (gardens from many small gardens, with several tea pavilions by the ponds, a view of the garden for walking and guessing poetry lines in landscapes).

The following types of Japanese gardens are given in the monograph by H. Shevtsova: gardens with large ponds for boat trips, stone Zen gardens for contemplation and meditation, gardens on hills, tea gardens, a garden for contemplation from the pavilion, and not for walks [36, *128 –130*].

Between the Chinese and Japanese gardens, in addition to the similar philosophical and religious origins of animistic religions and Buddhism, there are similarities in certain landscape techniques (first of all, if we talk about Japanese gardens for relaxation and walking, and not for meditation), as well as in similarities with poetry and with the genres of ink painting and with calligraphy, which was equally highly valued in China and Japan.

A number of landscape techniques, such as highlighting the main and the secondary, the subordination of architecture and small forms to the created landscape environment, the use of the play of light and shadow, the embodiment of real landscapes in miniature, can be found in both Chinese and Japanese gardens.

A certain similarity is also present in the types of garden elements in China and Japan – such elements are water (lakes, ponds, streams), natural rough stones of irregular shape, living plants and trees, with the peculiarity that water moves in a Chinese garden, and in a Japanese garden in the second period, running water is often replaced by stagnant marsh, overgrown with marsh grasses and flowers. If we talk about the sacred symbolism of stone in landscape design, then in China, it is a symbol of the masculine principle of Yang with water with the symbolism of the feminine principle of Yin, in Japanese Zen Buddhism – the embodied soul of a holy hermit, and stones covered with moss were especially revered. Both in China and in Japan, a stone of the most natural form, not processed by a master, was especially appreciated.

However, a comparative analysis of the types of gardens in China and the above types of gardens in Japan shows how the regional characteristics of the Japanese garden have manifested themselves over time. In China, we can distinguish primarily the imperial gardens, tomb gardens, private gardens, temple gardens. On similar principles, the so-called "gardens of natural landscapes" were formed, natural areas with pavilions in forests, mountains, on the banks of rivers and lakes, which, although they were not gardens, however, they used similar landscape techniques of the pavilion in the natural environment, with the only reservation that landscape paintings in this case were created not by human, but by nature itself, and human only used their expressiveness and enhanced it with the architecture of the pavilions.

Most researchers of Chinese landscape design emphasize the generality of landscape techniques in both large and small gardens, where similar landscape paintings were reproduced simply on a smaller scale and with greater detail. On the contrary, according to the list of Japanese gardens given by N. Brunov, it can be noted that in Japan there were several rather different types of gardens, which, although they had a common basis, were different functional and visual implementation. However, Zen rock gardens also have an echo of Chinese temple rock gardens, although they were not as popular as in Japan. Examples are the "Garden of Ten Thousand Stones" and the "Mountain Abode of Rough Stones" by the Shi-tao monk. Another significant difference between a Chinese garden and a Japanese garden is that the Chinese garden was designed to be viewed from different points as we moved through the garden, when landscape paintings were constantly changing and created the

feeling of an ideal natural space for pleasure, while Japanese gardens ("Kansho") were not intended for walking and were viewed from one place, and there was no change of many different landscape paintings in them, they differed in symbolic sacred minimalism and were aimed not at pleasure, but at inner concentration.

In the Chinese garden, there are no grassy lawns familiar to Europeans, just as there is no tradition to preserve the moss cover, as in Japan.

V. Ovchinnikov gave a remarkable description of the Japanese garden, especially emphasizing its non-identity with the Chinese garden: "No matter how great the commonality of the cultures of Japan and China, here they are fundamentally different. The pathos of Chinese art affirms the omnipotence of human hands. The Japanese artist does not dictate his will to the material, but reveals the beauty inherent in it" [30]. This difference also lies in the theoretical canons of beauty formed in Japan, developed on the basis of the syncretism of Shinto and Buddhism [30, *40–41*]:

- "– Sabi – beauty is equal to naturalness. Charm with traces of age. Literally means "rust", the charm of antiquity, the stamp of time. Sabi is the connection between art and nature.
- Wabi is a bridge between art and everyday life. The beauty of the ordinary, the beauty of simplicity. Lack of catchy, pretentious.
- Shibuy is what a person with good taste would call beautiful. This is the beauty of simplicity plus the beauty of naturalness. The beauty inherent in the purpose of the object, inherent in the material from which it is made. With the minimum processing of the material – the maximum practicality of the product. Continuity in art is reflected not in form, but in content.
- Yugen – embodies the skill of a hint or subtext, the beauty of reticence."

These canons of ideal beauty are different from the canons of beauty in China. In China, there is literally no Sabi in landscape design – rapture with obvious traces of antiquity, mossy stones, all landscape paintings are in the nature of well-groomed. Wabi – the beauty of the mundane is also alien to the Chinese garden, aimed at enjoying carefully selected beautiful landscapes, even if it is not a man-made landscape. Shibuy in Chinese landscape design, although partly present in admiring natural stones, however, the wooden structures of the pavilions, although made of natural material, are at the same time covered with exquisite carvings and brightly colored, and even holes in the stones were originally skillfully punched by a human hand, and only then began the case was completed by water, giving the holes a natural look. Shibuy principles are present in their purest form in China only in some simple remote mountain arbors with a thatched roof and wooden structures with the color

Fig. 2. The Philosophical Garden (Karesansui Dry Garden or Rock Garden) at Ryoanji Monastery. Ukyo District. Kyoto [photo by Polina Zueva. The 15th of stones are located on a rectangular area of 25 meters, among pure white gravel]

of natural material. Yugen in the Chinese version is embodied in the symbolic meaning of individual elements of the Chinese garden – in the symbolism of "one lake, three mountains", in winding indirect paths to block the path of erect evil heavenly spirits, in the allusion of a landscape and verse lines, etc., however, this all the same allegory and hidden meaning associated precisely with local beliefs.

The glorification of the variability and impermanence of the Universe in China and Japan took place in different ways: in Japan, this symbol was the three stages of cherry blossom (the first flowers, full color, falling of petals, of which the stage of falling of petals was most appreciated), in China in garden design this variability was expressed through the constant alternation, as in a kaleidoscope, of landscape paintings.

V. Ovchinnikov noted an important feature of the traditional art of Japan, based on asymmetry as an expression of the perpetual motion and circulation of phenomena in nature: asymmetry denies pairing [30, p. 43]. China should be mentioned here, where sculptures often stand in pairs, especially symbolic sculptures of a lion with a ball under its paw and a lioness with a lion cub under its paw, vases are paired, etc.

V. Ovchinnikov writes: "The highest concept of Yugen can be considered a poem made of stone and sand, called the philosophical garden. Tea master Soami created a philosophical garden at Ryoanji (Ryoanji Temple) in Kyoto (Fig. 2) 400 years before the modern language of abstract art.

Stones on white gravel in the garden – to feel the true meaning of such creativity, its asymmetric harmony, which expresses the universal essence of things, the eternity of the world in its endless variability" [30, *43*]. This reveals another feature of the traditional Japanese garden and its difference from the Chinese garden – monochrome and the absence of living plants for creating a garden – an experiment that was subsequently continued by the European avant-garde.

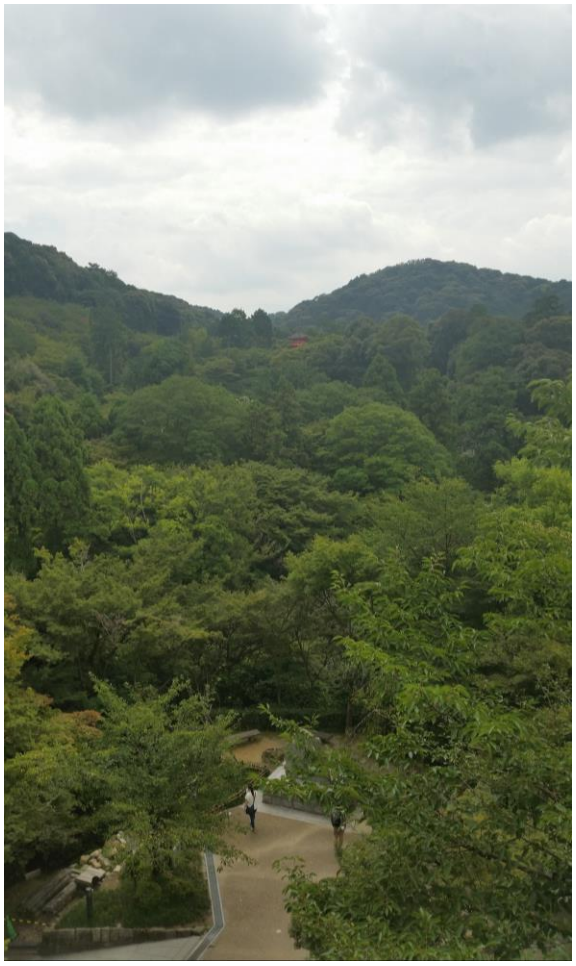

Fig. 3. The picturesque garden of the Kiyomizu-dera temple complex. Kyoto [photo by Polina Zueva]

Fig. 4. Eikando Temple Garden. Humpbacked bridges connect the pavilions. Kyoto [photo by Polina Zueva]

Fig. 5. The eastern rock garden of Nanzen-ji, the garden of the Hojo (abbot's chambers) is 70 % gravel and is characterized by maximum naturalness. Kyoto [photo by the author Polina Zueva]

Despite the prevalence of the ascetic type of "dry" Zen garden in Japan, there are other types of gardens in Japan, among the greenery, with pagodas and temples.

Characteristic historic gardens of Japan

The most famous gardens in Japan are the gardens at temples and monasteries, among the many of which we will name five characteristic.

Temple gardens

1. Garden of the Buddhist temple complex Kiyomizu-dera (清水寺) is otherwise – Otovasan Kiyomizudera (音羽山清水寺) known as Otovasan Kiyomizudera, Higashiyama district in eastern Kyoto (Fig. 3).

The complex was originally founded in the 778, but the surviving buildings are later, in the 1633. The main buildings are located at the average the slope of Mount Otova. To the south of the main temple (and there are several of them here) there are three streams that bear the symbolic name "Otov waterfalls" to the south of which there is an area with the poetic name of the Valley of Brocade Clouds. The entire territory of the monastery has been turned into a picturesque park.

2. The garden of the Buddhist temple Eikan-do in Kyoto is part of the territory of a complex of several pavilions connected by bridges, a park area, a traditional rock garden and a pond with carp (Fig. 4). The temple is famous for the statue of Mikaeri Amida (looking back Buddha Amida).

3. The garden of the Zen Buddhist temple Nanzen-ji (南禅寺) of the Rinzai school in Kyoto can be called a temple complex, because on its territory there is a functioning monastery and the 12th more temples of the Rinzai school. It was founded by Emperor Kameyama in the 1291 on the site of his previous palace. The Chinese influence was expressed in the fact that at the beginning of the XIV century the abbot of the monastery was a master from China Ishan Yining. On the territory of the Nanzen-ji temple there are four gardens, three of which are made using the dry garden technique – karesansui. One of the gardens is believed to have been made by the master Kobori Enshu in the 1629 and is a typical example of a Zen garden from the early Edo period. Garden views can be enjoyed from the long wooden deck.

The laconicism and harmony characteristic of Zen dry gardens unites space and stones into a single whole (Fig. 5).

4, 5. Gardens of Konchi-in Monastery as part of the Nanzen-ji temple complex in Sakyo-ku. The monastery suffered in the 15th century during the war, until the 17th century it was destroyed and rebuilt in 1600–1605 through the efforts of the abbot Isin Shuden, who commissioned Kobori Enshu to design two monastery gardens: the Konchi-in garden – "Crane and Turtle" and the garden in front of the

Fig. 6. Rock garden "Crane and Turtle", the proper name "Tsuru-Kameno-niva", Konchi-in monastery as part of the temple complex Nanzen-ji. Kyoto [photo by Polina Zueva]

Fig. 7. Plan of the Shugakuin Imperial Villa. Upper villa. Medium villa. Lower villa [photo by Polina Zueva]

Fig. 8. View of the "Bathing Dragon" pond from the pavilion of the Upper Villa [photo by Polina Zueva]

main temple of the Nanzen-ji monastery. Both gardens were the embodiment of the landscape traditions of the Muromachi period (1333–1568). There are traditions of a garden like karesansui ("dry mountains and waters"), for which the stones were carefully selected according to their shape, color, texture, and correspondence to the style of the complex. It was during the Muromachi era that the first rock gardens appeared – karesansui and sikichyo (stone garden).

The "Crane and Turtle" rock garden, its own name "Tsuru-Kameno-niva" (Fig. 6), was designed by Kobori Enshu in 1627–1632, an innovation was the observation of the dry garden, not as usual, from the terrace of the temple, but from the stone bridge in front of the temple, that is, the original concept of the "rock garden" was deliberately changed – viewing from only one point and from one angle, here there is a view from the side and frontal, from the terrace of the temple.

It is from the terrace that the whole idea of a "rock garden" is most fully revealed, a very elongated garden with a massive group of stones on the left (they symbolize a turtle) and an old juniper tree located above these stones – a symbol of Zen Buddhism.

Symmetrically and almost in line with the turtle group, there is an even more massive group of rocks with straight geometric edges, which symbolizes the crane in flight. Also beautifully trimmed large camellias and rhododendrons of a round, slightly flattened shape represent the shell of a turtle, and tall pines in the background, individual plants and stones bear the image of a crane.

Imperial Gardens

1. The garden of the imperial villa Shugakuin (Shugakuin) on the northeastern outskirts of Kyoto was planned at the behest of Emperor Gomitsuno. The first stage of the garden planning continued from 1656 to 1659, then, with a break, the work continued for several more years. The uniqueness of the garden and its difference from other gardens in Japan lies in its terraced location on three terraces along the mountainside, with a villa on each terrace, which led to the specific layout of the ensemble (Figs. 7, 8).

As in the historical Chinese gardens, the technique of "borrowing the landscape" (in Japan "sakezi") acquires a special role here, that is, the inclusion of distant perspectives of mountains and greenery in landscape paintings, there was a clear division: the distant planes were formed by natural elements, the foreground – by man-made. The challenge was to create a contrast or fusion of these two plans. Commonality with calligraphy and the genre "shang-shui" reveals the outline of the reservoir and the composition of the waterfall of the upper terrace; however, for all the skill of drawing foregrounds, the most appreciated are the picturesque perspectives of distant plans, reminiscent of Buddhist ink painting.

There are also similarities between traditional Japanese painting and landscape paintings: from the Rinuntei Pavilion ("Near the Clouds"), a view opens up that resembles paintings of the 15th century, there is a large curved tree and bushes in the foreground, with a slight mountain silhouette in the distance. It is precisely because of the similarity with murals and painting that researchers note the "theatricality" of landscape paintings.

Unlike the ascetic Zen rock gardens, there is a technique of alternating landscape paintings – a combination of a man-made foreground with gardens, moss-covered and stone paths, a waterfall and several ponds for boating and a miraculous background.

Signs of a traditional Japanese garden

The origins of the Japanese garden date back to the emergence of the formation of the Yamato State and the adoption of Buddhism in the 6th century,

and the very appearance of the ancient and medieval gardens indicates the existence of cultural ties between Japan, China and Korea. The formation of landscape gardening art in Japan was significantly influenced by the system of worldview, in which Buddhism occupied the most important place. The philosophy of Buddhism in conjunction with the sacred attitude of man to nature, which was determined by the national religion Shintoism, led to the emergence of a garden characteristic only of Japanese culture and the development of specific volumetric-spatial and artistic thinking in working with space and natural materials.

During periods of relative isolation of Japan on the basis of artistic and technical borrowings from China and Korea until the middle of the 19th century. developed their own traditions of gardening and landscape art.

In the course of historical development, several types of gardens have formed:

1. The court aristocracy created the landscape gardens of the shinden-zukuri;
2. Followers of the teachings of Zen Buddhism developed "dry" gardens (karesansui);
3. Representatives of the military class laid the foundations for the development of multifunctional gardens;
4. Tea connoisseurs cultivated tea ceremony gardens (roji);
5. Craftsmen and traders brought to life small gardens (tsuboniva).

With Japan's entry into the capitalist phase of development, the garden was heavily influenced by the landscape design trends of the Western world.

According to modern research, the development of Japanese gardening art is divided into stages [36]:

1. 6th – 7th centuries, the Asuka period, marked by the reproduction of ancient Korean gardens.
2. 8th – 12th centuries, the periods of Nara – Heian, are associated with the formation and development of the aesthetic foundations of landscape and landscape art and the creation of a type of garden based on Chinese borrowings.
3. 13th – 16th centuries, during the Kamakura – Muromachi periods, there is a transition from man-made landscape and landscape compositions to "dry" ones, called Karesansui gardens and associated with the worldview of Zen Buddhism.
4. Second half of the 16th – mid-19th centuries, the periods of Momoyama – Edo, the heyday of extensive daimyo gardens with complex layouts, garden and park ensembles of imperial palaces and villas, gardens of tea ceremonies and chamber gardens of city dwellings. This era is considered the highest flowering of Japanese landscape design.
5. Late 19th – early 21st centuries, Meiji period – up to the present, the formation of the Japanese garden passes through the synthesis of the cultures of the East and West and is marked by the process of transition from tradition to modernism. During this period, the first public garden and park complexes appeared and Western approaches and techniques were used in the planning of Japanese gardens and parks.

Throughout the development of Japanese landscape design, architecture has determined the proportions of the Japanese garden and its space. The artistic appearance of the gardens and parks was shaped by painting and aesthetics. Their plot-like content was associated with national literature.

Having identified the stages of Japanese landscape design, one can trace the main trends in the development of national garden art and its relationship with architecture, fine arts, literature, aesthetics of Japanese society. A garden in Japanese culture throughout its history has remained the quintessence of the unique connection between human, nature and religion.

Lessons of traditional Japanese garden for contemporary landscape architecture

Continuity and sustainable adaptations of traditions, maintenance of the spirit of place and empathy for the place very often become the stimuli for sustainable social and economic processes. According to M. Vecco [39], such intangible category as spirit of place may have significant impact on sustainability of the locality. Contemporary UNESCO heritage preservation policy expressed by the concept of historic urban landscape also encourages to look for the sustainable development patterns in the local heritage. In this light the peculiarities of Japanese gardens highlighted in the perspective of comparison with Chinese tradition can become a valuable source of inspiration for meaningful and sustainable contemporary landscape design.

Modern parks in Japan speak about the resilience of Japanese landscape traditions, a classic example of which is the Namba Park, created on the site of a baseball stadium in Osaka in 2003 by the architect Jon Jerde, which has already been called the "modern hanging gardens of Babylon", adding natural features to the rigid planning structure of modern buildings (Fig. 9).

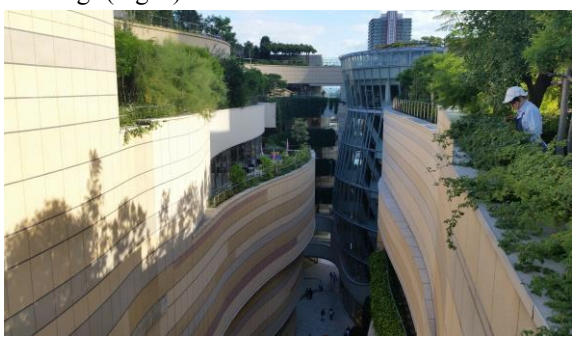

Fig. 9. Modern garden Namba Park. Osaka. Created in 2003. The landscape architect of the project, Jon Jerde, proposed integrating a huge green park into the rich and tough environment of the metropolis. View from the terrace [Photo by Polina Zueva]

Namba Park is, in fact, a multifunctional complex greened with exotic plants and trees with a Parks Tower business center, a shopping center, an entertainment area, an art space, a modern residential complex and picturesque, interconnected terraced park areas with waterfalls, green lawns, water bodies and cliffs on eight levels of a modern complex. This design solution is especially relevant for a super-dense urban environment. The construction of the complex took place in two stages: the first part with an area of 297,000 m^2 was opened in 2003, the second – 75,000 m^2 – in 2007. Greenery occupies an important part of the territory – these are terraced parks and greenery on the roof of the Parks Tower business center. In fact, free access to a modern botanical garden with over 70,000 seasonal plants and 300 trees was opened.

Thus, listing and reviewing selected examples of Japanese gardens located in Kyoto: Thus, listing and considering selected examples of Japanese gardens located in Kyoto: the philosophical garden at Ryoanji monastery, the garden of the Kiyomizu-dera Buddhist temple complex, the garden of the Eikan-do Buddhist temple, the garden of the Zen Buddhist Nanzen-ji temple of the Rinzai school, the Hojo garden in the Daitokuji Monastery, the Konchi-in Monastery garden within the Nanzen-ji Temple complex in Sakyo-ku, the Shugakuin (Shugakuin) Imperial Villa Garden on the northeastern outskirts of Kyoto, and the modern multi-level Namba Park 2003 in Osaka, of note, that modern landscape architects actively use the centuries-old achievements of national garden art, combining ancient compositional traditions with modern solutions, materials and forms.

The above-presented analysis of historical and contemporary Japanese gardens in comparison to traditional Chinese landscape architecture revealed numerous correspondences with contemporary sustainable environmental design trends: biophilic design, sustainability aesthetics, environmental aesthetics etc. Below we present several points of potential integration of traditional and contemporary aspects in landscape design based on analyzed Japanese garden traditions.

Biophilic design. Biophilic design is quite recent approach aimed at bringing nature into the artificial human habitat and creating nature inspired environments for humans. According to the proponents of biophilic design such as S. Kellert [19], W. Browning et al. [2], N. Salingaros [34], natural elements, materials, and patterns in our living and working environments contribute to human well-being and health. According to N. Salingaros [34], positive effects of biophilic design are conditioned by: "close proximity and visual contact with plants, animals, and other people and positive response to artificial creations that follow geometrical rules for the structure of organisms". The analysis has revealed that various features and patterns contemporarily attributed to biophilic design are abundant in traditional Japanese garden design – light variations, creation of miniature landscape features, bringing nature into the city, using naturaly shaped irregular stones, preserving moss etc. – and can serve as a source of inspiration for present day landscape designers.

Less tangible consumption. Currently numerous thinkers in the field of sustainability underline such notions as less tangible consumption, green consumption etc. as for real transition towards sustainability the shift of consumerist mindset towards more spiritual direction is required. The idea of contemplation of garden made of mere natural elements, sometimes of just gravel and stones, can be seen as a higher form of sustainable consumption desirable in contemporary societies. Landscapes aimed for contemplation could become desirable practice in contemporary garden design as well. Garden is a perfect place for contemplation of such concepts as permanence and temporariness. Moreover, the study of ecological aesthetics perception by M. Dekay [4] has revealed five levels of aesthetic perception related to the visual, sensory perception, experience of the place and the wider knowledge and understanding of ecological connectedness and evolution. The possibity of multi-level perception of traditional Japanese garden related with religious and philosophical concepts can serve as a source for inspiration for creating contemporary landscape designs enabling the perception and appreciation at multiple levels. This is relevant in the general context of post-modernist design where the designed object is aimed „to speak multiple languages“ as well.

Co-creation with nature. According to M. Hemmati [10] "mimicry of natural process is more important than the mimicry of natural forms" in contemporary sustainable landscape architecture. Still water swampy ponds with vegetation in traditional Japanese gardens can be seen as the example of re-creation of natural ecological processes. Moreover, co-creation together with nature is characteristic to contemporary ecological art and sustainability aesthetics movements as well as it was underlined by S. Kagan [18]. These ideas correspond very well with traditional Japanese beauty concepts sabi and vabi focused at the beauty of aging and everyday aesthetics.

Conclusion

The result of the presented study was a comparison of the features of landscape design in Japan at different periods, a concentrated description of the types of characteristic gardens and an analysis of their influence on modern landscape design in Japan. The authors identified a number of controversial provisions in the existing scientific approaches of different researchers.

The study of the origins and originality of Japanese landscape traditions in comparison with Chinese garden and park principles proves the existence of both commonality between them and regional differences. Without a doubt, Chinese gardening art formed the basis of Japanese landscape design, especially in the early period, because in Japan there are gardens and landscape paintings created according to Chinese models. The commonality between Chinese and Japanese gardens is primarily in the philosophical and religious basis and syncretism of local animistic religions and Buddhism.

At the same time, both the culture of China and the culture of Japan have always been so strongly distinguished by regionalism that any traditions introduced from the outside were sooner or later transformed on the national soil into something else. The same is true for Japanese gardens: they gradually expand the list of gardens, temple gardens for contemplation and meditation are added to gardens purely for relaxation and entertainment (the latter took place in China, but they did not become the most famous types of gardens in China).

The spread of Zen Buddhism in Japan globally modified the concept of a garden borrowed from China as a paradise on Earth for a pleasant pastime and strengthened, accentuated precisely the philosophical, moral side of human existence. Today, in conditions of environmental problems, we increasingly turn to the experience of the countries of the East, where the traditions of harmony of architecture and natural environment have been developed and improved.

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Modern Chinese and Japanese garden as a symbol of national identity in the context of globalism

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Abstract. The article considers examples of modern gardens and parks with elements of Chinese and Japanese landscape design, analyzes the degree of their similarity with historic gardens. A comparative analysis of historic gardens and modern gardens and parks is carried out in order to prove which elements of traditional oriental landscape design are cited the most. A set of elements that embody national identity in modern Chinese and Japanese gardens is argued. It is shown how, over time, including under the direct influence of multiculturalism and in connection with the typification of pavilions for mass construction, the concentrated national features of eastern gardens were gradually smoothed out. As the most recognizable elements of modern Chinese gardens, pavilions, sculpture, compositions of stones, Japanese gardens – gates-torii, pagodas, compositions of boulders, "dry gardens", landscaping with sakura, coniferous trees, and Japanese maples were identified. Compared to Chinese gardens, in a modern Japanese garden outside of Japan there may be no buildings at all or their number is minimal, and the natural environment itself is more natural. On the contrary, the Chinese garden outside of China showcases the art of landscape design and the craftsmanship of man-made landscape paintings.

Keywords: Japanese garden, Chinese garden, national memory, modernity, simplification of landscape design, multiculturalism

Introduction

The deepening of a number of ecological problems of modern humanity leads to the fact that the theme of the natural environment, the increase of green areas, and ecological architecture is beginning to sound more and more insistent. In this regard, it seems logical to be fascinated by quoting exotic principles of Chinese and Japanese landscape design, including outside China and Japan, and this process is particularly active in the post-Soviet space. It is worth recalling that something similar happened in European society during the birth of Modern Style / Art Nouveau, because Japanese culture, based on polytheism and the specific spiritual syncretism of Shinto and Buddhism, seemed to society a way out of the crisis of traditional values of the time. It was then that almost all the most prominent Impressionist artists experienced their "Japanese period" of fascination with the East, as did the English graphic artist Aubrey Beardsley. Looking even further, several centuries earlier, Europe experienced the same craze for China, which was reflected in the mass appearance of "tea houses", "Chinese palaces", "Chinese gazebos" and stylized pagodas in royal and aristocratic residences. Consequently, such a craze for the East, which occurs in waves, conceals a certain social and psychological phenomenon – when a society is going through the next stage of a crisis of traditional values, it inevitably looks for a way out in phenomena that are opposite to tradition, and often this way out turns out to be precisely the culture of the countries of the East with millennial national traditions – China and Japan.

Many scientific sources contain the thesis that the uniqueness of the cultures of China and Japan is based on respect for nature as an exponent of ideal harmony and beauty, which has found a concentrated expression in the traditional gardens of China and Japan, many of which (such as the gardens of Suzhou) have become not only national, but also a world cultural heritage and are included in the UNESCO World Heritage List.

China and Japan today feel the influence of the trends of globalism and multiculturalism, and in these conditions they try to preserve the historical heritage of landscape architecture as much as possible, contribute to the revival of historical traditions in modern culture and architecture.

The emergence of a new wave of interest in Chinese and Japanese gardens outside these two countries has become a reason to speculate about such a phenomenon as the emergence of new gardens and parks in Chinese and Japanese style in territories remote from China and Japan. The authors analyzed examples of several such gardens in order to explain this phenomenon, which is in many ways akin to an earlier phenomenon of the Chinoiserie style. In addition, it is noted that in many cases such typified buildings have acquired a purely utilitarian purpose of pavilions on personal plots. In the case when such gazebos are produced in large quantities, they cannot, by definition, have such a complex silhouette, original roofs or small decor, as the historical pavilions, which are included in the monument protective lists. In this case, the silhouette,

the outlines of the roofs are simplified, the material of the roof is changed to modern material, the polychromy changes.

Matherials and Methods

For the analysis, the following were used: the method of field surveys, the method of photographic recording, historical analysis, comparative analysis.

The methods of field surveys and photographic recording allowed the authors to bring the evidence base under their theoretical conclusions. The authors studied modern parks in the oriental style, the principles of their design, a set of small architectural forms. The method of historical analysis made it possible, on the contrary, to provide a theoretical basis for images and statements, made it possible to identify the origins and reasons for the formation of certain specific features of the traditional Chinese and Japanese garden and their embodiment in modern oriental gardens outside China and Japan.

The method of comparative analysis allowed us to compare the tendencies of traditional landscape design in China and Japan and in modern gardens, to show which elements of the oriental garden turned out to be the most stable symbols of China and Japan in modern gardens and parks.

The identification of such elements-carriers of national identity is especially important, as it proves that these elements proved to be the most resistant to changes in architecture and design and retained their recognizability (for example, torii and pagodas in Japan, pagodas and pavilions in China). Therefore, knowing this recognizable set of the most characteristic elements of a traditional Chinese and Japanese garden, you can pre-program their combination in new oriental-style parks.

The specificity of the tasks set determined the selection of basic sources. The following became the basis for the preparation of the study:

- Chinese sources on traditional gardens – publications by L. Gong [1], C. Li [6], D. Liu [7], J. Pan [13], Y. Pei [14], L. Qin [15];
- European sources dedicated to Japanese gardens – publications by S. Mostovoy [8], N. Nikolaeva [9-10], H. Shevtsova [16];
- scientometric publications of recent years devoted to the study of Chinese and Japanese gardens – articles by Yu. Ivashko, D. Chernyshev, P. Chang [2], Yu. Ivashko, D. Kuśnierz-Krupa, P. Chang [3], Yu. Ivashko, P. Chang, A. Dmytrenko, T. Kozłowski, D. Mykhailovskyi [4], M. Orlenko, Yu. Ivashko, M. Dyomin, A. Dmytrenko, P. Chang [11], M. Orlenko, Yu. Ivashko, P. Chang, Y. Ding, M. Krupa, K. Kuśnierz, I.G. Sandu [12].

Researchers have identified the philosophical and religious foundations on which Chinese and then Japanese landscape art traditionally developed, revealed the sacred and symbolic meaning of the main landscape techniques with certain names, the hidden meaning of individual small architectural forms and natural components, such as a reservoir, a group of stones, hill, etc.

The analysis of the sources proved the relevance of the research topic and helped to outline the circle of little-studied aspects. In particular, there is an extensive scientific base devoted to the historical gardens of China and Japan, however, there is practically no scientific research of modern gardens and parks in Japanese and Chinese style outside of China and Japan, their correspondence to historical traditions has not been studied.

According to the authors of the article, such studies are necessary, since today there are many proposals from various design and construction companies for the arrangement of such gardens, however, such projects are often developed without a deep understanding of the historical traditions of the Chinese and Japanese gardens. Therefore, the authors were tasked with analyzing modern gardens from the point of view of their stylistic authenticity.

Consequently, the study of basic sources identified a range of little-studied aspects that it was decided to analyze in the presented publication: in particular, a comparative analysis of examples of modern Chinese and Japanese gardens outside China and Japan was not carried out, including in relation to authentic historical gardens, which would allow to show how the elements of traditional landscape design are modified and in some cases simplified when transferred to foreign soil, that is, a phenomenon akin to the earlier phenomenon of the Chinoiserie style in Western Europe occurs, which also manifested itself in a significant simplification and limitation of the number of quoted oriental elements.

Results and Discussion

The authors selected a few representative examples of contemporary Chinese and Japanese-style gardens outside China and Japan and analyzed their relevance to historical patterns. Today these are not only large parks and squares, but also small exotic corners, alien to the environment.

We managed to explore such a small eastern chamber corner with a characteristic pavilion, entrance, accented with red torii and a small pond. This composition does not at all correspond to the adjacent modern large exhibition complex, located a little further to the modern cathedral of modernist architecture and multi-storey residential complexes on the banks of the Dnipro bay.

The authors wondered why a part of Japan appeared quite a long time ago in such a strange place, not even in a park area (Fig. 1).

Fig. 1. A Chinese-Japanese-style garden composition near the International Exhibition Center on Brovarskyi Avenue [photo by Yang Ding, 2021]

It turned out that this is a visual advertisement of the manufacturer of arbors "Artel Vabros", whose office is located in a small wooden building next to it. Despite the fact that the producers wanted to create an authentic atmosphere, in fact, they created a kind of China-Japan mix, combining torii (a sign of Japan) with a garden pavilion called "Yin-yang" (a sign of China). Such a gazebo is a standard one, measuring 6x3.5 m in plan, with a four-pitched curved roof with an overhang of up to 1.3 m, more reminiscent of Chinese pavilions, rather than Japanese ones. A wooden gazebo, made of oak and / or pine, with a bituminous shingle roof, intended for a garden plot, it can be installed within a few days on the ground, on stones or on the water.

Consequently, modified and typed Chinese and Japanese pavilions become not only elements of modern gardens, but also visual advertising of products for private plots. The "Artel Vabros" company specializes in the production of modern Chinese and Japanese gazebos, bridges, furniture, that is, various park buildings in an oriental style. Such pavilions are also installed in the garden center "Eva" in the village Vita-Poshtova and at the exhibition area of the pavilions in Bucha. One of the modern trends is the typing of gazebo projects for private construction, which implies a simplification of forms, decor, polychromy in comparison with historical pavilions.

In addition to the improvement of private household plots, the creation of public spaces – gardens and parks in the Chinese and Japanese styles – has intensified.

Park "Kyoto"
in Lisovyi residential area in Kyiv

Park "Kyoto" is the oldest Japanese-style garden-park in Kyiv. It was founded in 1972 along Kyoto Street and Brovarskyi Avenue as a sign of friendship between the twin cities of Kyiv and Kyoto. Today this green area is a monument of landscape and gardening art of local importance, and since 2018 it has been included in the natural reserve fund of Ukraine.

Fig. 2. A pagoda in the Kyoto Park [photo by Yang Ding, 2021]

Fig. 3. Torii in Kyoto Park against the background of a composition of stones [photo by Yang Ding, 2021]

The formation of the Kyoto Park took place in several stages. For the opening of the park in 1972, Kyoto donated a small stylized pagoda, which became the center of the park. For the next anniversary of the establishment of twinning relations, in 2011, the tobacco company "Japan Tobacco International" presented the city with 360 traditional Japanese cherry blossoms (*sakura*), from which the cherry blossom alley was planted. In the same year, work was carried out to restore the reservoirs, the arrangement of stone-paved paths, an alpine slide with picturesque compositions of natural stones, torii were installed, highlighting the entrance to the park, and decorative stone lanterns in the Japanese style were installed. The sakura alley with a length of 978 meters in 2012 was registered in the

National Register of Records of Ukraine as the longest in Ukraine.

In 2013, the next improvement work was carried out in the Kyoto Park, and in 2017 the first stage of the reconstructed park with a rock garden with a dry lake and unique lighting, developed by the designer of Japanese parks, Shiro Nakane, was inaugurated.

In 2018, the second stage of landscaping the park was completed with a landscape composition with a decorative lake, a cascading waterfall and a new pagoda (Fig.2).

The third stage of the reconstruction began in 2019, at the same time the side entrance was accented with stylized red Japanese torii (Fig.3), oriented towards the semantic center of the park with symbolic elements – a pagoda, compositions from groups of stones, a pond with bridges. It is noteworthy that, as is customary in Japanese landscape art, some of the stones are covered with lichens and mosses.

The compositional center of the park stretched along the avenue and the route of the city metro is an artificial hill – allusion of Mount Fujiama, a decorative pagoda, an artificial reservoir with wooden bridges and several alpine slides with compositions of natural boulders. At the foot of one of the hills there is a dry stream lined with stone. A little in the distance – two buildings – a canopy and a pavilion for the protection of the park, in a stylized oriental style. Numerous sakura trees, pines, and Japanese maples give the landscape a picturesque and authentic landscape.

In the appearance of the Kyoto Park, Japanese designers, in collaboration with Ukrainian specialists, have collected those iconic elements that symbolize Japan – Japanese cherry blossoms (*sakura*), stylized red mejin-torii, a stylized pagoda with the image of Buddha, an artificial reservoir with low bridges, slides with picturesque groups of stones, "dry" reservoir. In the Kyoto Park there are allusions to both the traditional Japanese garden of the Shuyu type and the ascetic Zen Buddhist "dry garden" "Kansho".

If we analyze the historical accuracy of the stylized Japanese small forms presented in the park, their correspondence to the originals is noticeable. For example, a small pagoda by the reservoir reproduces the type of the Jusanju-no-to pagoda. Based on the monograph by H. Shevtsova, you can see the variety of types of Japanese pagodas, of which there are twelve [16, p. 224-225]: Goju-no-to, Taju-to (Taima-dera), Ho-to (Honmonji), Sanju-no-to (Hokiju), Hakkaku-sanju-no-to (Anrakuji), Taho-to, dai-to (Negoroji), Sorin-to, Jusanju-no-to, Gorin-to, Hokyoin-to, Sekito, Ho-to. Traditionally, it was believed that the principle of cyclicality was embodied in the Japanese Buddhist pagoda.

The presence of a stylized pagoda tō (塔, lit. pagoda, sometimes 仏 塔, lit. Buddhist pagoda) or toba (塔 婆, lit. pagoda) in Kyoto Park is not accidental. The traditions of the Japanese pagodas originate from the Chinese pagodas, and these, in turn, from the Indian Buddhist stupas. Originally, pagodas served as reliquaries and were an important part of Buddhist temples and monasteries. Over time, pagodas began to be built at Shinto temples. Traditionally, pagodas in Japan were built of wood and called mokuto (木塔, lit. Wooden pagoda), however, the most common pagodas made of stone, called sekito (石塔, lit. Stone Pagoda). And if wooden pagodas are multi-storey, large, spacious, then stone pagodas were traditionally small, less than 3 meters and without premises inside.

Consequently, a Sekito stone pagoda of the Jusanju-no-to type is installed in Kyoto Park, and since it is multi-tiered, this is a variety according to the number of tiers of the tasoto stone pagoda (多層 塔, literally multi-story pagoda) or tajuto (多重 塔, lit. multi-story pagoda).

You can catch the similarities between the stone pagoda at Kyoto Park and the 16-tiered stone pagoda at Choshouji in Kamakura. Such low pagodas most often did not have internal rooms for relics and were dedicated to the Buddha, therefore there is a relief image of the Buddha on one of the facades of a low pagoda in the Kyoto Park. The number of tiers of this type of stone pagodas ranges from three to thirteen, in the pagoda in Kyoto Park there are seven low tiers, crowned with a high spire, and it is installed on a stepped base. Around the pagoda there are picturesque compositions of large boulders.

Japanese garden
near the Toyota office in Kyiv

The Japanese garden near the Toyota office in Kyiv looks rather unusual, primarily because it is also completely discordant with the surrounding environment.

The history of the creation of this unusual garden is as follows. At the end of October 2016, a traditional eco-campaign entitled "I bought a car – plant a tree" was awarded, organized by the Ukrainian branch of Toyota in conjunction with a charitable foundation. This ecological action is precisely aimed at greening cities and increasing the area of green plantations. Such actions were initiated by Toyota-Ukraine in April 2007, and over the period from 2007 to 2016, more than 3800 trees, bushes and plants were planted. During one eco-campaign in 2016 alone, more than 700 green plants were planted, and all such actions involve employees of Toyota-Ukraine and their families, customers and employees of Toyota Center Kyiv "City Plaza".

The participation of large companies in environmental programs is a national feature of Japan.

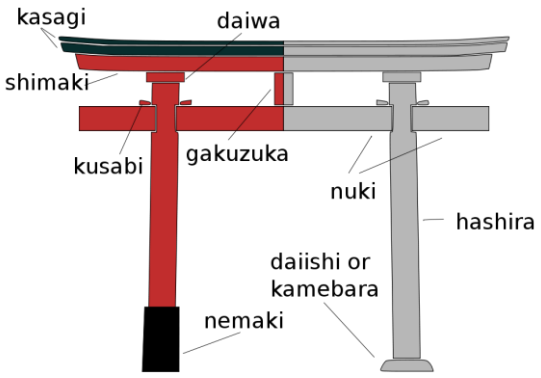

Fig. 4. The traditional constructive scheme for torii. [https: //commons.wikimedia.org/wiki/File: Torii_nomenclature.svg? Uselang = ru]

Fig. 5. Stylized torii in the garden near the Toyota office in Kyiv [photo by Yang Ding, 2021]

Fig. 6. Compositions of stones in the garden near the Toyota office in Kyiv [photo by Ding Yan, 2021]

Thus, the 2016 eco-campaign coincided with the receipt by Toyota-Ukraine of a certificate for the environmental management system in accordance with the international standard ISO 14001:2015, and this certificate is another confirmation that caring for the environment is one of the principles, which is guided by Toyota-Ukraine in its daily activities.

Here it is worth mentioning why a part of a Japanese garden, albeit a very simplified one, has appeared in the modern business part of Kyiv. As conceived by the organizers, in addition to the goal of greening the city, the goal was to create a part of Japan in Kyiv, so that every Kyivite could touch the culture of the Land of the Rising Sun. For several years, work was carried out on the landscape design of the Japanese garden, and today it is open to all comers.

The authors analyzed the principles of the Japanese eco-garden in Kyiv and traditional Japanese gardens in order to assess their similarity. To create an authentic impression, the entrance to the garden near the Toyota office is designed in the form of stylized torii. Torii (Japanese 鳥 居, sometimes spelled 鳥 栖 or 鶏 栖) is an ancient symbol of a Shinto shrine, a U-shaped gate without flaps, standing on the way (so-called sando) to a Shinto shrine; it is torii that mark the beginning of a sacred territory. There are several versions of the sacred origin of torii, known in Japan since the 10th century, according to one of them their prototype was the Indian Buddhist ritual gates of the Toran from four cardinal directions on the way to a stupa or burial, according to the other – ritual pillars marking the beginning of a sacred site in Japan. The traditional torii construction consists of two vertical pillars connected by two horizontal beams, and there are two styles of torii – shimmei torii with simple pillars and mejin torii with pillars on a stone base and with a double curved upper beam (Fig. 4).

In the garden of Kyiv, stylization of the type of myojin-torii in the characteristic traditional color of cinnabar of all elements, with the exception of the lower part, painted black, is presented, made in metal structures, which is also an allusion to the traditional red torii with the black color of the nemaki base (Fig. 5).

The traditional oldest torii in Japan were made of wood and stone, without decoration, under the influence of Buddhism they acquired most often a bright red color, less often white, and the lower elements could be black.

Stylized torii in a garden in Kyiv are significantly simplified in form, compared to historical samples, embodied in unconventional material (completely in metal), however, they are a recognizable Japanese element due to stylized outlines and characteristic colors, which indicates that the form is more important rather than literal repetition of material.

In Japanese gardens, all landscape design was based on the religious syncretism of Shinto and Buddhism and on the inviolability of the canons. Unlike China with its desire to create a hedonistic natural environment, a more ascetic branch of landscape design has spread in Japan, aimed not at pleasure, but at inner self-contemplation. Stones that, singly or in the form of groups, expressed a certain hidden meaning and gave rise to certain emotions, acquired almost the main significance in the traditional Japanese garden.

If we analyze what are the signs of a traditional Japanese garden in a garden in Kyiv, then the following should be noted.

First of all, torii were not part of the garden space.

In addition to picturesque groups of trees and stones in the Japanese garden, there could be ponds with islands and bridges, pavilions, and also at the early stage of the Heian period – picturesque landscape sceneries, in which the direct influence of China is seen.

In the Kyiv garden there are no reservoirs and bridges, all the more there is no moss between the stones of the paths, and the stones of local rocks themselves are laid out in fancifully curved paths or placed in high mesh containers on a hill (Fig. 6).

There are no traditional Japanese garden pavilions in the Kyiv garden either. If we try to analyze to which period of traditional Japanese landscape design the Kyiv version of the Japanese garden is closer, then, in our opinion, rather to the second period of the 12th–13th centuries, when the Japanese garden becomes more ascetic, with a smaller set of constituent elements, and the species pictures are revealed as you walk through the garden. If we talk about the inheritance of a particular type of garden, then in the Kyiv garden there are signs of "Shuyu" –type of gardens for walking, and signs of "Kansho" gardens, a "rock garden", which do not imply natural reservoirs.

A parallel should be drawn here with a slightly different solution to the modern Japanese garden in Japan. We are talking about Namba Parks, which does not have such a direct allusion to the historical Japanese gardens, then this multi-level green space does not resemble, for example, "rock gardens" as much as the Japanese garden in Kyiv.

Here we can talk about two fundamentally different tasks: Japanese (like Chinese) gardens outside China and Japan should maximally express the image of these countries for foreigners, therefore, they concentrate the most recognizable elements of the cultures of these countries, even those that were not historically characteristic it is landscape design (stone lions in Chinese gardens, torii in Japanese, etc.).

Chinese "Garden of Friendship" on Liteiny Avenue in St. Petersburg

An example of a modern garden in Chinese style outside of China can be called the Chinese "Garden of Friendship" on Liteiny Avenue, opened in 2003, on the occasion of the 300th anniversary of St. Petersburg. The garden became a symbolic gift to the city from the Chinese sister city of Shanghai and, according to the donors' plan, it is a reduced quotation of the real Shanghai Yu Yuan garden (Garden of Joy or Garden of leisurely rest) ((Chinese: 豫园, pinyin Yùyuán). It is noteworthy that, as in the case of the Japanese garden near the Toyota office, the Chinese garden on Liteiny Avenue is located on the busy highway of the metropolis and contrasts with it with its exotic look. The landscaping and layout of the garden was carried out by architects and workers from Shanghai.

The Yu Yuan Garden, located in the old city of Nanshi, is an example of a private Chinese garden of about 4 hectares, built by a former treasurer of the Ming period for his elderly father. The garden was created in the period 1559–1709 and changed its owners several times, was restored and acquired its modern look in 1956. There are such traditional elements of the Chinese garden as:

- alternation of landscape sceneries;
- the presence of a reservoir with a gallery on natural stones, leading to an exquisite pavilion;
- pavilions with curved roofs standing on a podium on stilts above the water;
- artificial islands with compositions of bizarre stones;
- picturesque bridges connecting the banks and pavilions.

The territory of the modern Chinese garden on Liteiny Avenue covers an area of more than 2,000 m^2. Unlike the minimalist Japanese garden in Kyiv, where, with the exception of a few benches with urns and torii, there are no other small architectural forms, there are several of them in the Chinese garden: the Friendship Pagoda pavilion, stone figures of Chinese lions on the sides of the main entrance, decorative barrels "Tai hu shi" with ornaments, an artificial reservoir with a stone bridge, a fountain, a small waterfall, "Wall of dragons" with images in the technique of bas-relief.

Plants in the garden were also brought from China to create the most authentic impression, these are low-growing varieties of willow, pine, apple. To add even more romance to this place, cherry blossoms were also planted.

The largest object in the garden is the Friendship Pagoda Pavilion, which was conceived as a traditional pavilion for the tea ceremony (Fig. 7).

This pavilion faithfully reproduces the appearance of an authentic Chinese garden pavilion. Examples of such pavilions with a round window and a roof curved at the top are also found in the

Fig. 7. Friendship Pagoda Pavilion. from the rear façade [photo by Olga Ushakova, 2021]

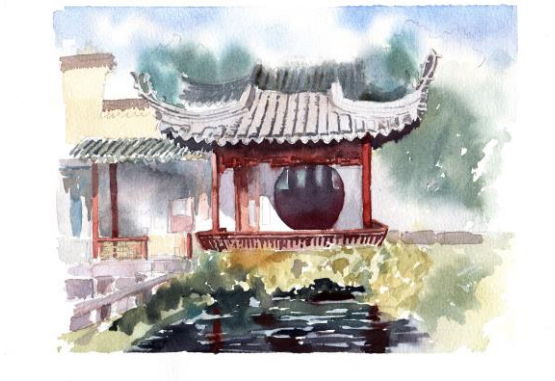

Fig. 8. Kuan Yu Tang Pavilion in Liuyuan Garden [watercolor by Peng Chang, 2021]

Fig. 9. Friendship Pagoda Pavilion. Main façade [photo by Olga Ushakova, 2021]

classic historical gardens of Suzhou, which are included in the UNESCO World Heritage List.

The tradition of the appearance of a window in the wall of the pavilion, opposite to the entrance to it, is associated with the landscape technique "landscape as a picture in a frame". Such windows could have various shapes: in the Shang Ting Pavilion in Shijilin Park, it is "fan-shaped", in the Kuan Yu Tang Pavilion in the Liuyuan Garden (Fig. 8), Beyu Dong Tian Ting in the Zhuozheng Yuan Garden – round, as in the garden on the Liteiny Avenue. If we put images of historical and modern pavilions side by side, their similarity is noticeable (Fig. 9).

The similarity of both pavilions – in the Liuyuan garden and in the garden on Liteiny Avenue – is as follows.

By composition: a dynamic symmetrical volume with an active silhouette and accentuation of the central axis using a round opening (in a number of sources it is called a "moon window", although in this case it is an entrance). In both pavilions, a four-part horizontal division of the volume was used (roof, cornice and sub-cornice part, wall, basement), but in the garden on Liteiny Avenue the basement is quite narrow.

There is a similarity in the morphology of forms: a curved tiled roof with a large offset, a cornice and a sub-cornice part, round columns, openings, and a fence.

It is noteworthy that the Friendship Pagoda Pavilion on Liteiny Avenue is all-facade, the round opening is not a window, but an entrance, the pavilion is partially open, since it has a back and two side walls with openings.

There is also a noticeable similarity in polychromy, which is traditionally very rich and bright in China, since colors have a symbolic meaning, and a special role in the color scheme is assigned to red, which is always abundant in buildings. In both pavilions, the red color dominates in the coloring of the load-bearing and supporting structural elements, the walls are white, contrasting with the red color of the structural elements, however, the structures of the modern pavilion are already modern, metallic, not the traditional wooden dougong system. In addition, unlike the historic wooden pavilions, the metal structures are not adorned with carved décor.

Thus, as in the case of the torii of the Japanese garden in Kyiv, we can talk about the stylized heritage of the traditional form of the Chinese garden pavilion without inheriting the traditional materials and structures for the embodiment of these forms.

The main entrance to the Friendship Pagoda Pavilion is flanked by two traditional Chinese stone lions, traditionally considered protectors from evil

spirits. It should be noted here that this technique is more similar to the Taihedyan Pavilion in the Forbidden City in Beijing, since usually lions flanked the main entrance to a politically significant building, which was not the pavilion in the historical gardens. Here we can talk more about the most concentrated image of China as a whole outside its borders, than about the literal historical accuracy of traditional Chinese landscape design.

In addition, the main entrance and the spacious open space in front of it are distinguished by the picturesquely located stone barrels "tai hu shi", decorated with ornaments, and groups of stones. As conceived by the designers, it was an allusion to the historical Chinese method of "city mountains and groves", when the stones in the garden vaguely resembled real mountain landscapes.

On both sides of the path there are large bizarre tai-hu-shi stones brought from Lake Taihu. Rocks from this lake have historically been used for stone slides in the gardens of China.

A bright spot in the landscape composition of the garden is the "Wall of Dragons" with a spacious platform-podium in front of it. On the wall, in the technique of a bas-relief made of polychrome glazed ceramics, nine main Chinese dragons are depicted as carriers of certain functions: the dragon Yai-tzu protected from diseases, Ba-xia – gave special strength, Suan-ni protected from betrayal, Pau-lao – from unexpected danger, Bi-gao helped to avoid problems with the authorities and the law, Qiu-nu attracted positive energy, the Bi-xi assisted in self-improvement, Zhao-feng was considered the keeper of sacred shrines, Zhi-wen was the symbolic embodiment of running water. The images of dragons are framed with Chinese ornament.

The tree species in the garden were selected taking into account the absence of the need to trim them and the ease of creating decorative crowns.

Conclusions

The experience of creating modern Chinese and Japanese gardens outside China and Japan suggests the appearance of a phenomenon somewhat akin to the Chinoiserie style in previous centuries. An analysis of modern Chinese and Japanese gardens outside China and Japan made it possible to identify the main semantic elements that should express the image of the country outside its borders. In modern Japanese gardens, as such "iconic" elements expressing national identity entrances-torii of red color, usually made of metal, but with recognizable outlines, picturesque groups of stones, reservoirs with bridges, "dry gardens", occasionally – single small forms – pagodas, gazebos, pavilions, stone lanterns are used. As a rule, conifers, sakura trees, Japanese maples are planted.

Chinese gardens in the image are more polychrome, finely decorated, with a large number of buildings and small architectural forms – vases, sculptures, bridges, steles, pavilions and pavilions.

This allows us to say that in modern Japanese gardens outside of Japan there may be no buildings at all, and the basis is the natural environment with an emphasis on the theme of compositions made of stones, and in Chinese gardens attention is paid not only to nature, but also to saturation of the garden space with man-made elements – gazebos, sculptures, lanterns, pavilions, etc., which once again proves the difference that persists in modern Chinese and Japanese gardens – the Japanese garden is more restrained, minimalistic, tends to a more natural landscape, the Chinese one is brighter, saturated with details, elements, does not give the impression of an untouched landscape, on the contrary, it shows the skill of landscape design.

The appearance of such gardens outside China and Japan testifies to the fact that the historical landscape traditions of the East have not lost their relevance and arouse the interest of modern customers and landscape designers.

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Kopsavilkums. Rakstā aplūkoti mūsdienu dārzu un parku piemēri ar ķīniešu un japāņu ainavu dizaina elementiem. Izvērtēta to līdzības pakāpe ar vēsturiskajiem dārziem. Tiek veikta vēsturisko dārzu un mūsdienu dārzu un parku salīdzinošā analīze, lai pierādītu, kuri tradicionālā austrumu ainavu dizaina elementi tiek citēti visvairāk. Elementu kopums, kas mūsdienu ķīniešu valodā iemieso nacionālo identitāti.

Pētījuma procesā tika apzināti ķīniešu dārzi, paviljoni, skulptūras, akmeņu kompozīcijas, japāņu dārzi, pagodas, laukakmeņu kompozīcijas, "sausie dārzi", izpētīta apzaļumošana ar sakurām, skuju kokiem un japāņu kļavām.

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Interaction of landscape and indoor space in architecture of Roja open-air stage / summer concert hall

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Abstract. In the art of environmental design, architecture, landscape architecture and interiors need to be balanced through interdisciplinary collaborative planning to enhance the psycho-emotional quality of environment, and in this respect, the study of the interaction of landscapes and indoor space through comparative analysis and inductive reference continue. Enclosed by evergreen Vacciniosa type of forest, the impressive building of the new Roja Stage / Summer Concert Hall has been standing proudly on the shores of the Gulf of Riga since 2019. The building actively contrasts with the surrounding landscape. The language of architectural forms in glass and concrete is geometrically sharp, saturated with broken lines and planes in contrast to the adjacent natural landscape, pine forest. The specific detailed case study underlines the importance of balanced interdisciplinary collaboration in harmonious interaction between architecture, landscape and indoor space.

Keywords: landscape architecture, architecture, interaction of landscape and indoor space, concert hall

Introduction

In Latvia, as well as globally, increasing attention is being paid to balance in every sense, as evidenced by one of the most important recent documents in the field of architectural policy [3]. The purpose of the Latvian Architecture Policy developed in line with the concept and principles of the built environment culture as defined in the Davos Declaration, is to create conditions for quality design and sustainability of individual and public living space based on high-quality architecture [1]. One of the principles of the Latvian Construction Law is sustainability needed for a quality living environment for present and future generations thus promoting efficient use of natural resources [5].

In today's complex construction processes, environmental makers are striving to stay positive in the face of the growing need for deeper interdisciplinary collaborative planning, and we all as environmental users need to strive for environmental integrity and harmony [1; 3; 6; 11; 14]. The need of harmonious interaction between landscapes and indoor space is underlined by the rapidly changing role of architecture, high involvement of the users of environment in the processes of creating public spaces and new technologies. This is not only facilitated by an increasing use of transparent extensive glazed surfaces in architectural exteriors, visually uniting landscape and interior space by means of illusionary and plastic architectural forms [6; 10], but also by direct extensive connection of landscape and interior space without using glass, through employing 21st- century technological achievements in designing. An extensively open space with and without glazed planes, partially covered visual links between landscape and indoor space expands through sound, smell, and tactile effects. The present study of the interaction between landscape and indoor space is pursued in the search for balancing factors between architecture, landscape architecture and interiors, needed to improve planning based on interdisciplinary collaboration and to enhance the psycho-emotional quality of the environment. The pattern of the interaction of landscape and indoor space today consists of an endless combination of different factors. The most important visual factors are divided into five criteria that help assess composition and proportions, colours, lights and shadows drawn by sunlight, visual accents in chiaroscuro, visual merging of indoors and landscape and architectural forms in landscape [6]. Analysing the effects observed in both directions (looking from the landscape towards the interior space) and vice versa provides a more complete assessment of the interaction.

At the beginning of the 21st century, the Latvian landscape has been enriched with several expressive concert halls, important for the decentralization of cultural processes in the country.

Roja Concert Hall is one of the seven cultural sites to promote sustainable development of local cultural and natural heritage in Kurzeme, created within the project "Creation of new nature and cultural tourism services on the western coast of the Gulf of Riga". The project has been implemented by Jūrmala City Council in cooperation with the municipalities of Roja, Mērsrags and Engure [9].

Aim of the research – to identify the contributing factors for harmonious interaction of landscape and indoor space in the art of environment design in

Latvia (case study of the Roja open-air stage / summer concert hall).

Research tasks.

1. To evaluate the interaction of landscape and indoor space in the particular architecture of the object.
2. To define the factors of harmonious interaction of landscape and indoor space in the art of environment design.

The theoretical and practical significance of the present work is to promote the development of harmonious high-quality spatial environments in Latvia through a better cooperation between architects, landscape architects and interior designers.

Materials and Methods

The interaction of landscape and indoor space in architecture of Roja open-air stage / summer concert hall in Latvia. The visual inspection was conducted in August 2020 – October 2021 when the author took photos of the research object. *Research methods:* **comparative analysis method** (photographic recording, analysis of interaction factors according to common criteria) and **inductive cognitive method**.

The application of comparative method in summarizing information for the research [6].

- The criteria for evaluating psycho-emotional interaction of indoor space and landscape:
  - evaluation of spatial composition and proportions of glazed surfaces versus non-glazed parts;
  - evaluation of compositional application of colour, light and shadow impacted by sunlight;
  - evaluation of visual accents created by chiaroscuro;
  - evaluation of visual merging of indoor space and landscape.
- Evaluation of architectural forms in landscape.

Results and Discussion

Interaction of landscape and indoor space under the influence of visual perception

Roja open-air stage / summer concert hall:

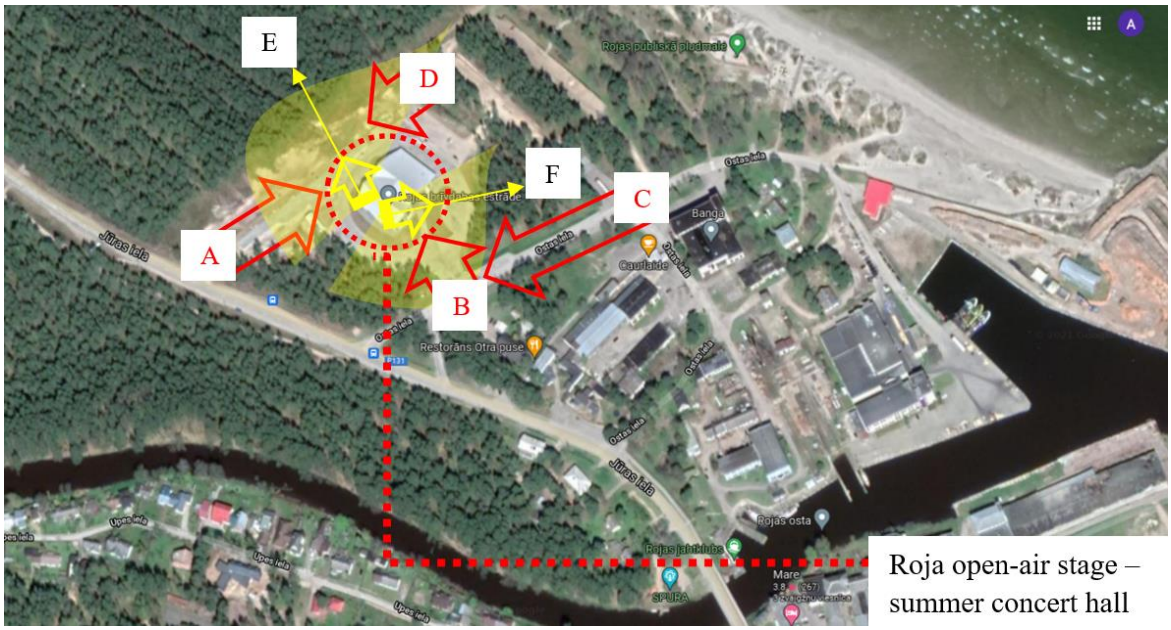
- Address – Jūras Street 10, Roja, Latvia (Figure 1).
- Built in 2019.
- Architectural design – SIA Modus R, Dace Rampāne, Aiga Kurpniece. Contest entry – design (size: 2211, 40 m²), 2016–2017. Supervision, 2018– 2019.
- Built by SIA "A Celtne".

With the investment of European Union funds, a new and modern summer concert hall [2; 8] has been built in Roja, located 100 metres from the Baltic Sea and the beach of Roja. Roja Summer Concert Hall is the centre of summer events in Northern Kurzeme, located on the outskirts of Roja town on the North Kurzeme highway P131 Tukums-Kolka (Figure 1; TABLE 1; 2). The concert hall is built as an open-plan structure with a roof in the shape of a stylised sea wave along its entire length. The building's interior is partly separated from landscape by glazed metal frame structures in the spectator area and visually opaque walls behind the stage. Latvia's changeable weather conditions, even in summer, often surprise with rain and wind, so to ensure smooth running of cultural events and the comfort of spectators and artists in our particular climate, serious investment in large-scale structures is needed [12]. The auditorium has a capacity of up to 1000 seats and 1000 parking spaces. At the moment, Roja open-air stage is the largest (27x16 m) in Latvia with very good acoustics. The concert hall's territory is spacious and well landscaped and is friendly for people with disabilities. The concert hall offers a wide range of events such as concerts by bands playing different musical styles, acoustic concerts, theatre performances, exhibitions, corporate events and sporting events, and many more. The open-air stage in Roja is a great place for creative expression.

Concert hall has a storage/utility room, two artist rooms, two toilets and an administration office. The total cost of the construction is EUR 3 328 610, with an EU contribution of EUR 600 000.

Context of natural foundation and greenery in the interaction of landscape and indoor space

The open-air stage is situated on the seaside of the Riga sea gulf, in a natural evergreen pine (*Pinus*) Vacciniosa forest with natural undergrowth, which is also partially preserved in the north west and south west parts of the territory of the concert hall. The main species in the tree stand is pine. Underwood is thin - Juniperus communis and Sorbus aucuparia. More than 80 species occur in ground vegetation [4; 7; 13]. The dominant plants in the ground stand are common cowslip (*Vaccinium vitis-idaea*), common bluebell (*Vaccinium myrtillus*), heather (*Calluna vulgaris*), sand cress (*Calamagrostis epigejos*), black chickweed (*Empetrum nigrum*). Characteristic mosses and lichens: Reber's rust (*Pleurozium schreberi*), glossy staghorn (*Hylocomium splendens*), dicranum (*Dicranum*), deer cladonia (*Cladonia rangiferina*). Heather stands take on a characteristic pink-purple colour in the second half of summer. The naturally formed landscape is a rich evergreen backdrop and the major value to be preserved that serves as a means of harmony in the interaction between the landscape and indoor space through architecture. The artificial earth mounds are covered with lawn. The spectator part of the building is surrounded by rhythmic evergreen planting of mountain pine (*Pinus mugo*) along the façade, following the topography of the mound, which makes the volume of the stage fit more harmoniously in the landscape. (Figure 1; TABLE 3; 4).



A; B; C; D; E - key viewpoints to the concert hall

Fig.1. Roja open-air stage / summer concert hall in landscape with view lines and points [graph by the author with googlemap, 2021, https://www.google.lv/maps/@57.5081839, 22.7978474,536m/data=!3m1!1e3?hl=lv]

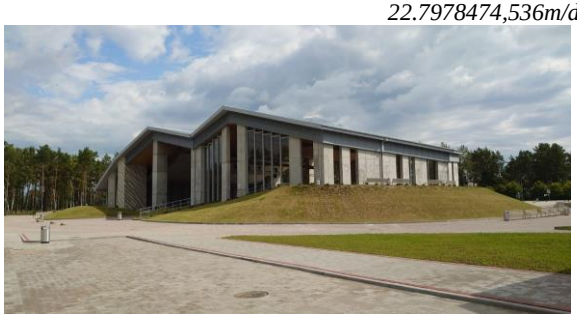


*Fig. 2. Roja open-air stage / summer concert hall in landscape, viewed from Jūras Street (View line **A**) [photo by the author, 2020]*

*Fig. 5. Roja open-air stage / summer concert hall in landscape (View line **C**) [photo by the author, 2020]*

*Fig. 3. Roja open-air stage / summer concert hall in landscape (View line **C**) [photo by the author, 2020]*

*Fig.6. Roja open-air stage / summer concert hall in landscape (View line **B**) [https://www.facebook.com/rojasbrivdabasestrade/photos]*

*Fig.4. Roja open-air stage / summer concert hall in landscape (View line **D**) [photo by the author, 2020].*

*Fig.7. Roja open-air stage / summer concert hall in landscape (View line **B**) [photo by the author, 2020]*

*Fig.8. Roja open-air stage / summer concert hall in landscape (View line **E**) [photo by the author, 2020]*

*Fig.9. Roja open-air stage / summer concert hall in landscape (View line **F**) [photo by the author, 2020]*

Psycho–emotional nature of spatial synthesis under the influence of natural and artificial light distribution

Analysing the importance of natural and artificial lighting in the interaction of landscape and indoor space in the architecture of the summer concert hall in Roja, it is necessary to emphasize the wide variability of external conditions in the rhythms of the day and season in Latvia.

The long twilight hours, the two seasons with different lighting and the changing meteorological weather affect only one aspect. In addition, artificial lighting produces a complex set of influencing factors (Figure1; TABLE 5; 6).

In line with the existing and prospective mobility habits of the users of this environment, key viewpoints to the concert hall (A; B; C; D; E) have been selected, which are further analysed in the study (Figure 1).

*Fig. 10. Roja open-air stage / summer concert hall in landscape (View line **B**) [photo by the author, 2020]*

*Fig. 11. Roja open-air stage / summer concert hall in landscape (View line **B**) [photo by the author, 2020]*

TABLE 1

Interaction of landscape and indoor space under the influence of visual perception.
View lines from landscape towards the architecture
[created by author, 2021]

No.	View marking and direction	Visual distance to the object	Distance walked	Description of results
1.	**View line A** (Figure 2), moving from Jūras street gate towards the north-east (towards Roja open-air stage).	~300—0 m	~300 m	The view of a pine forest massif reveals a large building volume on an artificial earth mound, which actively contrasts with the surrounding landscape. The language of architectural forms in glass and concrete is geometrically sharp, saturated with broken lines and planes, in contrast to the natural landscape of the adjacent pine forest massif. The volume of the building optically increases upon approaching the stage. The architectural detailing becomes more visually active, thanks to the fragmentary cladding of the building's long-lasting fibre cement facade boards. Tonal flashes of sand and brown coloured facade boards, light grey metal facade structures, their connecting elements and planes of reflective glass create a quality of detail. The extensive glazed planes actively reflect the surrounding woodland, greenery adjacent to the building and the changing sky. A fragmentary view of the stage part of the interior space can be perceived from the landscape.
2.	**View line B** (Figure 6; 7; 10; 11), moving to the north-west (towards Roja open-air stage), starting from the main entrance to the territory through Ostas Street gate.	~150—0 m	~150 m	A large forecourt separates the concert hall from the entrance gate, which is flanked on either side by a thinned pine forest and artificial mounds covered with lawn. The contrasting forms of the open-air stage fit visually well in landscape thanks to the proportions of the mounds and the scale of the forecourt. The glazed planes of the building volume serve as a mirror of the landscape. The stage part of the interior space is also partly perceptible from the landscape. As the building's volume is approached, the architectural detailing becomes more visually active, thanks to the fragmentary exterior finish with twisted, tonal panels (Cedral Classic, colour: forest soft C02, manufactured by Eternit Baltic) in sand and brown natural pastels, grey metal and reflective glass elements. Through the unglazed facade part and the interior, the landscape on the opposite side of the building is visible. Through glazed planes, depending on the lighting, the indoor viewing area and the landscape on the other side of the building can be partially perceived. The architecture create a unique harmony between the indoor space and the landscape.
3.	**View line C** (Figure 3; 5), moving away from the sea along Ostas Street to the south-west past Roja open-air stage towards the entrance gate of the site.	~350—150 m	~300 m	At the beginning of the line, looking away from the sea, behind the conifer trees, the open-air stage volume is not perceptible. Moving along line C, the architecture of the stage behind the thinned conifers gradually reveals itself, presenting a strong contrast with the landscape. The volume of the building poses a lesser contrast in this particular angle. Upon approaching the main gate, an intriguing interplay between the landscape and indoor space becomes visually apparent.
4.	**View line D** (Figure 4), moving from the north of the site to the south-west past the stage.	~100—0 m	~100 m	Due to the pitch of the roof, which is oriented in the direction of movement, the volume of the building appears visually smaller than when entering through the gate from Jūras street. The artificial mounds with lawn help the building to blend more harmoniously into the landscape. From this particular angle, there is an intense communication between the landscape and indoor space through the unglazed part of the façade, creating a coherent, interpenetrating cultural living space.

TABLE 2

Interaction of landscape and indoor space in visual perception.
View points from indoors space towards landscape [created by author, 2021]

No.	View marking and direction	Visual accessibility distance at ground level	Viewing angle	Description of results
1.	**View point E** (Figure 8)**,** looking from the landscape to the north-west.	up to ~250 m	>90 °~180°	Through the glazed and unglazed parts of the façade, an intensely harmonious visual communication with the adjacent natural landscape is created. The close proximity of pine forest allows the presence of nature to be richly infused into the interior. The elevation of the spectator section's floor gives the interaction between the landscape and indoor space a variety of angles.
2.	**View point F** (Figure 9)**,** looking from the landscape to the north-east.	up to ~200 m	>90 °~180°	Through the glazed and unglazed parts of the façade, an intensely harmonious visual communication is created with the adjacent artificial landscape in the foreground - plaza, man-made terrain with lawn and natural landscaped space in the background. The interaction between the landscape and indoor space is dynamically changing due to the elevation of the floor of the spectator section.

TABLE 3

Context of natural foundation and greenery in interaction of landscape and indoor space.
View lines from landscape towards architecture [created by author, 2021]

No.	View marking and direction	Description of results
1.	**View line A** (Figure 2)	The open-air stage is situated in a natural evergreen pine (*Pinus*) Vacciniosa forest with natural undergrowth, which is also partially preserved in the territory of the concert hall. The main species in the tree stand is pine. Underwood is thin - Juniperus communis and Sorbus aucuparia. The dominant plants in the ground stand are common cowslip (*Vaccinium vitis-idaea*), common bluebell (*Vaccinium myrtillus*), heather (*Calluna vulgaris*), sand cress (*Calamagrostis epigejos*), black chickweed (*Empetrum nigrum*). Characteristic mosses and lichens: Reber's rust (*Pleurozium schreberi*), glossy staghorn (*Hylocomium splendens*), dicranum (*Dicranum*), deer cladonia (*Cladonia rangiferina*). Heather stands take on a characteristic pink-purple colour in the second half of summer. The naturally formed landscape is a rich evergreen backdrop that serves as a means of harmony in the interaction between the landscape and indoor space through architecture. The artificial earth mounds are covered with lawn. The spectator part of the building is surrounded by rhythmic evergreen planting of mountain pine (*Pinus mugo*) along the façade, following the topography of the mound, which makes the volume of the stage fit more harmoniously in the landscape.
2.	**View line B** (Figure 6; 7; 10; 11)	The open-air stage is surrounded by evergreen natural pine forest with natural undergrowth and no distinct topography. Heather stands are characteristic of Vacciniosa undergrowth, with a distinctive pink and purple colour in the second half of summer, while in autumn rowan trees bring yellow shades to the landscape against evergreen conifers. Pine trees are an evergreen backdrop that serves the harmony between landscape and indoor space through the architecture. The artificial earth mounds are covered by lawn and a retaining wall, against which floral and plant arrangements and spatial installations are temporarily displayed. The building's spectator area is surrounded by rhythmic evergreen plantings of mountain pine in a line along the facade, following the mound's topography and adding to spatial harmony.
3.	**View line C** (Figure 3; 5)	The view line is dominated by the presence of a naturally formed evergreen pine forest in close-up with a naturally formed, relatively flat undergrowth. In the diverse undergrowth of the forest, among various mosses, lichens and other plants, heather stands are best visible mainly due to their distinctive pink and purple colour in the second half of summer, followed yellow colours of deciduous trees in autumn. The Vacciniosa pine forest, in all its diversity of plants, is a luxurious evergreen foreground that partially covers the sharp contrast of the open-air stage to landscape, allowing it to be gradually revealed visually from the sea.
4.	**View line D** (Figure 4)	The open-air stage is surrounded by an evergreen natural pine forest with natural undergrowth, characterised by green moss and heather stands with a distinct pink-purple colouring in the second half of summer. The pines are an evergreen backdrop that serves the harmony of the landscape and indoor space through the architecture. Artificial earth mounds are covered with lawn. Along the front of the building, rhythmic plantings of mountain pine in a single line, following the topography of the mound, complements the harmony of the landscape and the architecture.

TABLE 4

Context of natural foundation and greenery in interaction of landscape and indoor space.
View points from indoor to landscape space [created by author, 2021]

S. No.	View marking and direction	Description of results
1.	**View point E** (Figure 8)	Due to the distance, in the distant view line from indoors, one may mainly see evergreen silhouettes of pines in Vacciniosa forest. In the second half of summer, the undergrowth is visually coloured in shades of pink and purple by the flowering of heather, while in autumn the evergreen woodland is highlighted by the yellow leaves of the rowan. In the close-up behind the extensive glazed facade planes, the rhythmic planting of evergreen mountain pines can be seen, visually complementing the backdrop of extensive Vacciniosa pine forest. The grey paved area is enlivened by a separate mound of roundish forms covered with lawn..
2.	**View point F** (Fig. 9)	Vacciniosa pine forest is clearly visible in the distant view lines. The close plan is dominated by artificial mounds covered with lawn and rhythmic planting of mountain pines along the facade of the building, clearly visible through its extensive glazed planes. In the second half of summer, Vacciniosa undergrowth changes colour visually due to the flowering of heather.

TABLE 5

Psycho–emotional nature of spatial synthesis under the influence of natural and artificial light distribution.
View lines from landscape towards architecture [created by author, 2021]

S. No.	View marking and direction	Description of results
1.	**View line A** (Figure 2)	*Evaluation of compositional application of colour, light and shadow impacted by sunlight*: the colours of extensive glazed facade planes reflect the changing shapes of the surrounding forest and clouds, depending on the angle of sun rays and the amount of clouds. If it is not cloudy, north-western facades obtain sunset colours at certain angles in summer evenings, when the open-air stage is most often in use. Glazed parts of the facades are particularly brightly coloured by natural processes. *Evaluation of the use of visual accents created by chiaroscuro:* thanks to the predominantly south-west orientation of the stage and the openings in façades, the decorative wall of the stage, made up of vertical, spatially curved semi-cylindrical projections, becomes a living base for chiaroscuro and solar accents. The concrete phenomena can be observed both from landscape and from indoors. The fewer the clouds and the brighter the sunlight, the more expressive the play of solar accents on a decorative wall. In the dark hours of the day: thanks to artificial lighting and stage lighting, the stage acts as a bright, colour-changing accent in the landscape.
2.	**View line B** (Figure 6; 7; 10; 11)	*Evaluation of compositional application of colour, light and shadow impacted by sunlight*: the mutually parallel position of the opposing glazed facades of the building allows the planes of the glazed facade to reflect the surrounding landscape, while at the same time allowing the indoor spacer and the landscape behind the building to be transparent. Chiaroscuro on glazed planes creates a surreal image of the landscape, which is reinforced by the distinct vertical division of glazing. *Evaluation of the use of visual accents created by chiaroscuro*: two large openings in the south-east facade near the stage, symmetrical to the openings in the south-west facade, open up to view the stage and its decorative wall, which is made up of vertical, spatially curved semi-cylindrical projections and, depending on the intensity of sunlight and the amount of clouds, becomes dynamically changing under chiaroscuro and solar accents. In the dark hours of the day: under the influence of artificial lighting consisting of coloured indoor spotlights, the extensive coating of the summer concert hall takes a colour-changing shape and adds shine to the landscape. During events, the indoor concert hall is highly readable in landscape, thanks to the special effects created by artificial lighting.
3.	**View line C** (Figure 3; 5)	*Evaluation of compositional application of colour, light and shadow impacted by sunlight:* in the first half of the day, the main façade of the stage with the forecourt becomes visually striking and active in landscape, visually increasing the volume of the building. *Evaluation of the usage of visual accents created by chiaroscuro:* glazed planes of facades create accents of sunray chiaroscuro in the first half of the day. *In the dark hours of the day:* thanks to the artificial lighting resulting from changing coloured spotlights from indoors, the volume of the concert hall is well visible from the Ostas Street, bringing a strong accent and festive glow to the landscape.
4.	**View line D** (Figure 4)	*Evaluation of compositional application of colour, light and shadow impacted by sunlight:* in the second half of the day, the voluminous facade of the Summer Concert Hall, with broken forms on the south-western side, becomes visually active thanks to the impact of sunlight, accentuating the volume of the building. As the angle of sunrays narrows, the façade reflects sunset hues more vividly, shading also the spectator area indoors perceptible from landscape. *Evaluation of the usage of visual accents created by chiaroscuro play:* glazed parts of the façade dynamically reflect the visual accents created by chiaroscuro in the second part of the day. *In the dark hours of the day:* artificial lighting visually engages the users of the landscape in what is happening inside the concert hall, bringing a sense of variously coloured celebration into the landscape.

TABLE 6

Psycho–emotional nature of spatial synthesis under the influence of natural and artificial light distribution. View points from indoor space towards landscape [created by author, 2021]

Serial No.	View marking and direction	Description of results
1.	**View point E** (Figure 8)	*Evaluation of compositional application of colour, light and shadow impacted by sunlight:* in the first half of the day, the sun illuminates the adjacent pine forest, enhancing the interaction between the landscape and indoor space. In the second half of the day, the sun is to the left of the audience and illuminates the stage from the west. *Evaluation of the usage of visual accents created by chiaroscuro:* as the angle of sun rays narrows and the intensity of light and the amount of clouds increase, the decorative wall of the stage, made of vertical, spatially curved semi-cylindrical protrusions, takes on pink, dynamically changing hues and becomes a screen for the play of accents drawn by light-coloured, dynamically changing chiaroscuro and solar accents. *In the dark hours of the day:* the sun setting, the interaction between landscape and indoor space gradually diminishes, as the artificial lighting of the stage gradually draws everyone's attention.
2.	**View point F** (Figure 9)	*Evaluation of compositional application of colour, light and shadow impacted by sunlight:* in the light of sunlight, the landscape area enters very actively visually into an indoor area under comparative shading. In the first half of the day, the sun illuminates the stage and its decorative wall on the right. In the second half of the day, as the angle of the sun rays narrows through extensively glazed planes and the opening in the façade, the landscape takes on the hues of a sunset from inside. The illuminated pine silhouettes interact from landscape with indoor space as a strong accent. Depending on the amount of clouds that directly influences the intensity of sunlight, and the orientation of planes, or openings, of the glazed facades, the intensity of the interaction between landscape and indoor space changes.. *Evaluation of the usage of visual accents created by chiaroscuro play:* the decorative wall of the stage, in the first half of the day, depending on the intensity of the light and the amount of clouds, takes on shades and becomes a screen for a bright, dynamically changing play of light and sun accents. katuves dekoratīvā siena, dienas pirmajā pusē, atkarībā no gaismas intensitātes un mākoņu daudzuma, iegūst nokrāsas un kļūst par ekrānu gaišām, dinamiski mainīgām gaismēnu un saules akcentu spēles rotaļām. *In the dark hours of the day:* the sun setting, the interaction between landscape and indoor space gradually diminishes , because the intensive artificial lighting of the stage significantly outperforms the artificial lighting of the landscape.

Conclusions

On the shore of the Gulf of Riga, surrounded by the evergreen Vacciniosa forest, the voluminous building of the new Roja open-air stage / summer concert hall is revealed to the eye. The building partly rests on an artificial earth mound and actively contrasts with the surrounding landscape. A large forecourt separates the concert hall from entrance gate, surrounded on both sides by a thin pine forest and artificial mounds covered with lawn. The contrasting forms of the open-air stage volume are in visual harmony with natural landscape thanks to the proportions of artificial mounds and the scale of the forecourt.

The language of architectural forms expressed in glass and concrete is geometrically sharp, saturated with broken lines and planes in contrast to the adjacent natural landscape, a pine forest. Upon approaching the stage, the architectural detail begins to visually emerge, thanks to the building's fragmented finish of stranded durable fibre cement facade panels in merging sandy and brown natural pastel hues. The light grey metal facade structures, their connecting elements and planes of reflective glass create a quality of detail. Extensive glazed planes of the building envelope serve as a mirror of the landscape, actively reflecting the surrounding forest, greenery adjacent to the building and the changing sky. The interior of the building is perceptible in fragments when viewed from the landscape. At certain angles, there is intense communication between landscape and indoor space through glazed facade parts and openings in facades in the direction from the landscape to indoors and vice versa. The interaction between the landscape and indoor space acquires a variety of angles to be viewed from, thanks to the elevated floor of the spectator section. Architecture is the means of creating a unique, unified harmony between indoor cultural life and the landscape.

The existing natural Vacciniosa undergrowth without distinct topography has been partially preserved in the area of the concert hall. More than 80 species of plants can be found in the undergrowth. In autumn, rowan trees bring a yellow hue to the landscape against a background of evergreen conifers, while heather stands give the undergrowth its characteristic pinkish purple hue in the second half of summer. **The naturally formed landscape is a rich evergreen backdrop and the major value to be preserved serving as a means of harmony in the interaction between landscape and indoor space through th architecture.** The artificial earth mounds in the forecourt are covered by lawn. The spectator part of the building area is surrounded by rhythmic evergreen hill pine plantations in a line along the facade, following the topography of

the mound, which make the built part of the whole structure more harmoniously fit into the theme of the landscape.

Evaluation of compositional application of colour, light and shadow impacted by sunlight: the parallel positioning of two opposing extensively glazed facades of the building allows the colours of glazed facade planes to reflect the surrounding landscape and the changing cloud shapes in the sky in a variety of ways, while at the same time providing a view of the interior space and the landscape behind the building. Chiaroscuro on the glazed planes creates a surreal image of the landscape, reinforced by the distinct vertical division of the glazing. In summer evenings, when the open-air stage is most often in use, and in better weather conditions, the north-west facades and partly the interior spaces, are coloured in expressive sunset colours at certain angles. The glazed facade parts are particularly brightly coloured by natural processes. In the first half of the day, the sun illuminates the stage and its decorative wall on the right. In the second half of the day, as the angle of sunrays narrows through extensive glazed planes and the opening in the façade, the landscape, as perceived from the interior, takes on the sunset hues. Illuminated pine silhouettes in the landscape interact with interior space as a strong accent. Depending on the amount of clouds, which directly influences the intensity of sunlight, and the orientation of planes or openings in the glazed facades, the intensity of the interaction between the landscape and indoor space changes. *Evaluation of the usage of visual accents created by chiaroscuro:* thanks to the predominantly south-west orientation of the stage and the openings in facades, decorative stage wall made of vertical, spatially curved semi-cylindrical projections, becomes a lively base for chiaroscuro and solar accents. The particular phenomena can be observed both from the landscape and from indoors. The fewer the clouds and the brighter the sunlight, the more expressive the play of solar accents on the decorative wall. *In the dark hours of the day:* as the sun sets, the interaction between the landscape and indoor space, as seen from indoors, gradually diminishes as the artificial lighting of the stage gradually draws everyone's attention. Thanks to stage lighting, the concert hall acts as a bright, colour-changing accent in the landscape during dark hours of the day; artificial lighting visually engages the users of the landscape in what is happening inside the concert hall, introducing a comprehensive sense of festivity in the space.

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Kopsavilkums. Koncertzāles teritorijā daļēji saglabāta esošā dabiskā mētrāju zemsedze bez izteikta reljefa. Mētrāju zemsedzē sastopamas vairāk nekā 80 sugas. Galvenā suga kokaudzē – priede. Rudenī lapu koki ienes ainavu telpā dzeltenās nokrāsas uz mūžzaļo skuju koku fona, bet viršu audzes vasaras otrā pusē piešķir raksturīgo rozā, violetu nokrāsu zemsedzei. **Dabiski veidotā ainavu telpa ir bagātīgi veidots mūžzaļš fons un lielāka saglabājamā vērtība, kas kalpo kā harmonijas līdzeklis ainavu telpas un iekštelpas mijiedarbē caur arhitektūru.** Mākslīgi veidotos zemes uzbērumus sedz zāliens. Būvapjoma skatītāju daļu rindā gar fasādi, sekojot uzbēruma reljefam, ieskauj ritmiski mūžzaļi kalna priežu stādījumi, pateicoties kuriem, estrādes būvapjoms harmoniskāk ierakstās ainavu telpas tematikā.

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Parametric Biodigital Inspired Tessellation for Mass Customized Digital Fabrication

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Abstract. This paper researches the limits of repeating patterns that tesselate in a more artistic way for architectural application that is not limited to creating regular triangular, rectangular or hexagonal pieces with decorative purpose and sole material usage. Digitally parametric modeling and CAD-CAM paradigm with input-output sensorial microcontrollers, have brought the possibility to explore the limits of mixing up manual and automatized fabrication techniques with the infinite geometrical potential, implementing AI features. The applied research is being materialized into a mixed technique grayscale concrete floor-tiling prototype featuring concepts of passive flame-imitated indirect red light to enhance health benefits (Arduino microcontroller operated) and zero-waste manufacturing by carrying out CNC milling positive cast to a rubber mold to create an exact amount of geometrically matching pieces needed for the design.

Keywords: Arduino, CNC fabrication, mold-making, parametric tiling, patterns, polymers

Tiling patterns and the tessellation challenges

In search for available tiles in a retail market one would always find square and rectangular tiles first, some options in hexagonal or triangular shape and usually in a wide range of colors including textures that mimic or try to imitate natural materials like wood or various types of stones. That is about it when it comes to mass production due to the demand and some sales marketing research. The manufacturing quality sets the price range of such tiles from very cheap to luxurious designer styles that compete with real equivalent material costs like marble or hardwood. When it comes to practicality it is no doubt that ceramic tiles are good, durable and in general they are easy to install even by non-professionals. Sizes range from very small mosaic tiles to ones that are “oversize” or “jumbo”, measuring up to 1,8 meters or more in the longest dimension. The latter ones have become fashionable quite recently and they almost do not feature any joints meaning that in terms of decorative aspect they have a feel of an entire slab of the featured material. Only limitation is that these gigantic tiles are fragile in transportation, storage and installation. There is no such esthetical feature as aging patina in the tiles, so a dent, cracks or broken corners usually means that the whole tile needs to be replaced. Durability is questionable and one light damage can lead to severe visual defects.

Knowing this background information, we can see that the tile market is somehow limited both in the creativity and the lack of design qualities. Has this been addressed before? In art it has been done by a grand Dutch artist M.C. Escher in his entire lifelong career, trying to step out of the classic and standard geometry into the explorations of non-standard and extraordinary. Even more, Escher is known to have experimented with transitional shapes that have achieved to freeze the motion and morphing transitional forms that are on limits of the geometrical potential, also the dualities and mathematical surrealism. The work could be seen as “parametric” if he would have had computer modeling available in his time of the studies.

By the advent of computer modeling software, it has now become easier to explore the limits of tessellation and parametric modeling that just adds a whole new perspective to the possibilities. In the age of the digital parametric non-standard architecture, mathematics and geometry represent the core of the architectural design process [7]. A tool that plays a significant role for this aspect is the famous 3D modeling software Rhinoceros plugin “Grasshopper” that is a visual programming language. It is allowing the designers to build form generators from the simple to the awe-inspiring [4]. While the generative workflow seems very easy from the first look, it becomes clear with usage of these tools that good skills of geometry are still very much needed.

CAD-CAM paradigm meets sensorial microcontrollers (and AI)

Having the digital designs straightly available for digital manufacturing has changed how we understand the workflow of a designer in the 21st century. Let it be any shape and form in two or three dimensions, the only thing that limits the materialization is the manufacturing equipment and its operator's skillset and experience. Literally anything can be made physical and we have started to take it as a norm, so with the economy of time we can focus on more creative aspects and exploration of previously unseen complexity. Why designers always strive for the more innovation proves that we still have the thirst for the novel, for surprise and admiration of the beauty. Friedrich Nietzsche confirms it in a more philosophical way [3]:

"Admiration for a quality or an art can be so strong that it deters us from striving to possess it."

Going further with a design and searching what else could make it more complete takes us to artificial intelligence. Market of gadgets offers several integrated AI assistants like Siri or Google Assistant, or Alexa to automatize your home, control the lights and play music, take online shopping orders, just to name few of the functions. While these smart tools or "toys" seem to make our lives more comfortable, they are definitely also showing us what trends are being implemented into the everyday things around us. Still for the compatibility issues one would need adapters and special compatible accessories and most of all – electricity and an internet connection.

Author proposes that it is more feasible to work with a simpler alternative to imitate the AI with the usage of Arduino microcontrollers. These little and affordable devices can be running very complex tasks, and they have a huge potential in terms of interaction with the environment around us, wide range of input sensors and output reactions. The electronical components of Arduino are small enough to be integrated into the designable objects and the added value of the interactivity definitely can improve the user experience. For the theory of a complex behavior brought into the world and applied into a real design one would need to look for a possible physical space and a location, adding the factor that the design could be replicated easily – leading us to an integrated project-based research.

The design preconditions and conceptualization

Author did several extended brainstorming sessions to crystalize the possible design and find the innovation for a practical necessity. Since December 2018 author has been designing the first Net Zero Energy House in Mexico for his family residence, and at the moment of making this research there were three major opportunities of the design that were still in the to-do list to be built: hybrid wind and solar energy farm for off-grid energy production, automatic curtain shading system for the main façade and the Sauna design.

As every of these designs would be a great platform to experiment, author summed up the design task as following exercises:

- design has to explore advanced 2D tessellation;
- is easy to materialize with a laser cutting or CNC router;
- can be replicable addressing zero waste manufacturing principles;
- has a "feature" that involves programming certain intelligent behavior;
- possibly gives additional qualities like health benefits etc.

With this list of information, the decision was on behalf of a sauna – a central piece in a Scandinavian style home with presence of high temperatures and humidity, as there is a huge potential for almost every of the abovementioned aspects to be solved. As the space and its dimensions were already fixed and the metal framing partly built and the necessary insulation in the place, the designing exercises were narrowed down to solve somehow the least important element - floor. The sauna of this house features 2,6 x 1,5 meters of floor surface and the sauna room's height is 2,2 meters – an ideal dimension according to traditional Finnish Sauna design guidelines [6].

Development of the geometrical setup and the "maker" movement

First step in designing the tessellation started off with 2D formal exploration to see what geometries best adapt to the bounding box limits of the floor x and y dimension limits. Apparently by scaling up and down various simple polygons into this space, in particular the triangle had almost perfect dimension in a multiplication of its grid to accommodate the base figure in the given space 2x3 times. The full height fits in exactly twice and the width would occupy three full triangles by leaving only 1,92 centimeters of space unused in the total width dimension of 2,6 meters.

Roughly analyzing the formal proposal, it can be clearly seen that if this space would be tiled with pure triangles, it would cover an area of 12 triangles – where 10 would remain whole and two would be cut in halves, leaving zero leftovers of the triangles. This step followed several developments of rationalizing the shape to include absolute mirroring properties in any applied rotation, in order to eliminate the need of having too many different elements in the design. Adding complexity in an early stage of this design gave a great leverage further to simplify it back in both the proliferation and the fabrication processes. As the base figure is an equilateral triangle, its three outer edges were halved and substituted with two centrally oriented back-facing and mirrored rhombs that underline more of the previously discussed repeatability qualities. The final development of the form was based on having only three individually designed elements that would populate the entire floor design - one triangular, one four-edged and one five-edged modulation.

Ultimate designing phase implemented an intelligent curvature where the straight segments of the line become curved by weighted attraction in random direction, always pulling another coinciding edge of bordering geometries along with the same move vector, keeping all of it simple and always displaced at 120 degrees rotation. While this design seemingly has a complex appearance, it is also giving a false mirror effect while in the reality nothing is ever mirrored. The result gives a total mosaic piece count limited to just 84 pieces to cover

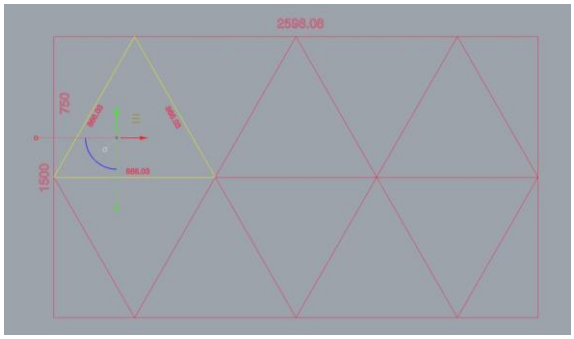

Fig. 1. Tessellation of 2x3 triangles along the floor plan's maximum bounding box of 2,6 x 1,5 meters left only 0,0192 meters (1,92 cm) of unused space [created by the author, 2021]

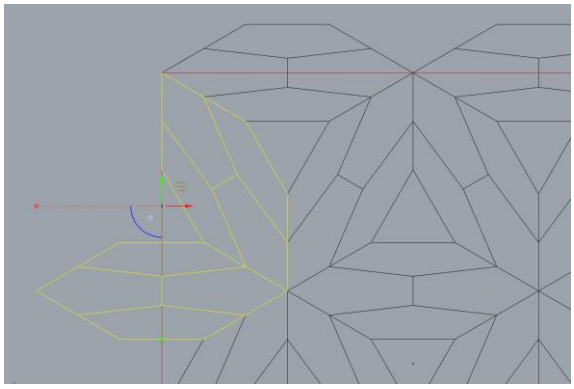

Fig. 2. Three element design to build the proliferation on a single 120-degree rotation [created by the author, 2021]

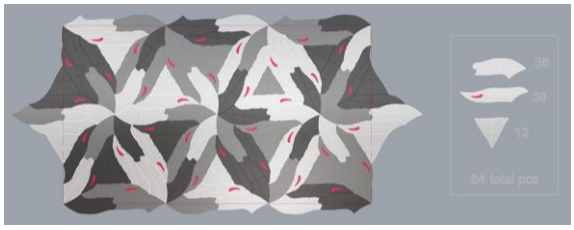

Fig. 3. Concrete shades at their best natural grayscale palette, ranging from white concrete made with white Portland cement and marble sand aggregate to natural gray concrete and lastly the usage of naturally black pigment additive to obtain black concrete. Additional red inlay is added to every third piece for more dynamic look and special features [created by the author, 2021]

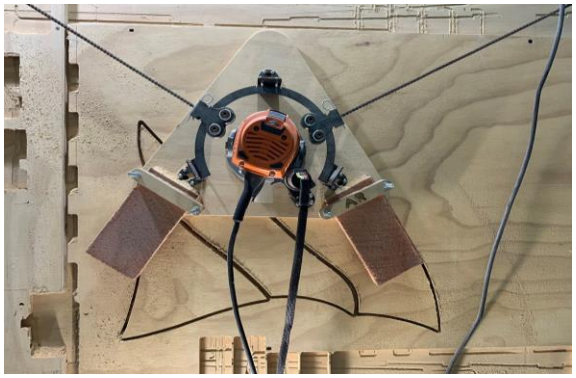

Fig. 4. Author's built Maslow CNC router in process of cutting out three main geometries from a 19 mm thick plywood sheet [photo Arne Riekstins, 2021]

the entire floor, all of it with just three types of modulated elements.

Material choice fell on the most malleable classic – pure concrete, that can take literally any shape and is the utmost durable to heavy temperature changes and extreme amount of humidity. Concrete could undergo the metamorphosis as it is freed from its untreated state and mechanical properties, becoming highly expressive, almost like it was done by artists of Lombardy back in the age of Art Nouveau [8]. As the plan was to cast these pieces only in the necessary amount, the game element to make it more graphical and vivid was the introduction of the variation of concrete tonalities. Three tones were chosen to keep the greyscale palette and underline the real shades what this natural material could feature. First color of this trio is the raw gray cement color unaltered, the second color has a natural black cement pigment that is mixed into the concrete and the third color is almost paperwhite using the same quality and strength white Portland cement with white marble sand and marble gravel aggregate. Before going to the design and making of the molds, author added to one of the modulated pieces a decorative droplet shape inlay, further discussed later in the making steps.

The need for an economic mold

At this level of complexity there must be a very simple and economical way to materialize the repeating pieces and fabricate the moldable original geometries in the 1:1 scale. As this step represents a true mass customization, the most economical way to quickly materialize the digital file to a physical piece was by a home-built CNC router built by author and based on the open source project Maslow CNC [5]. This particular engineering piece features a chain-hung Ridgid-branded hand router that operates in 3 axis with stepper motors and is run with an Arduino Mega microcontroller and a special proprietary prototype shield for the motors. The router is semi-automatic and relatively slow, but features quite high precision and massive full-sized plywood 1,22x2,44 meters of routing bed. The router reads standard ".nc" extension files and it operates directly from a proprietary software on a MacBook via an USB cable connection to Arduino. The total costs of such a router do not exceed 500 USD/EUR mark, including all the wood necessary for the frame, the hardware and the hand router tool itself. Running and maintenance costs are a fraction to any comparable industrial degree router of this size.

The typical problem is the customized mold making cost, so being effective in reproducing many identical cast pieces afterwards would be possible by usage of a rubber mold. It features a large lifespan, it is easy to take the finished pieces out nevertheless of the material stickiness or its geometrical complexity

Fig. 5. Plywood geometries are being almost totally covered with a liquid rubber molding agent. Pigment is just added before stirring it up so that it could be seen if the rubber mix has become uniform with the catalyzer. The cast is being made in seven batches of 200-300 grams each time and as it is quite heavy substance and has a working time of about two minutes from preparation to solidification. The edges of the mold are made of 5 mm foamboard to support the 2 cm side offset, and the backing thickness is less than a 1 cm just to keep the geometries together. In casting thin concrete pieces this is the most economical and reusable way of having an economical mold [photo Arne Riekstins, 2021]

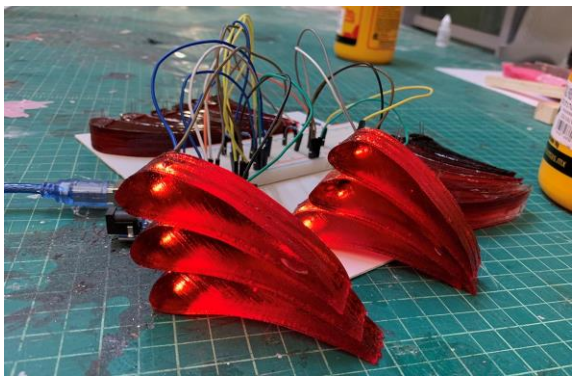

Fig. 6. Red resin droplets running a test pattern to imitate a burning fire effect - trios of LED lights randomly are being turned on with variable intensity, running a small up to 300 ms random time delay between another random value run, looped in 10 cycles. LED lights are bent 90 degrees and submerged in the middle of the 19 mm depth of the piece to shine sideways into the longitudinal axis of the translucent volume, illuminating the entire contour of the geometry [photo Arne Riekstins, 2021]

and can copy every detail of the original texture as well. From the three plywood pieces author casted total of five negative rubber molds, one for the triangular geometry that needs 12 final pieces and two per each four and five-edged geometries that both need 36 final pieces. By this the casting of concrete would be speed up double to total of 18 casting and demolding days. Meanwhile it was also clarified what material will be the little droplet featured in the design, so that became made into 6 mini molds to speed up the making of those 36 final pieces in six casting attempts. These aspects of saving time while still having a mass customization feature are essential for complex projects like this.

Being economic and maintaining an option for a special esthetical feature, the decorative droplet inlay became designed into a central element of the interactive lighting of the floor. As it can be totally incrusted to the concrete, a low voltage LED light can be embedded into a transparent or toned resin mass, keeping the wiring protected and intact forever under the floor. Here author did six trials with different red pigment intensities for obtaining a specific fire-imitating color shade when LED lights are being lit in series of three simultaneous lights at a time. Also, the angle of the LED projection played an essential role to illuminate 90 degrees sideways into the piece and bringing out all of its contour rather than shining straight upwards. The control of these lights is done by another Arduino Mega microcontroller that easily features 36 output connections at a time. Besides the system can be expanded to react to numerous external environmental factors.

Pieces coming together in a zero-waste fabrication for low carbon footprint

Last step was the most laborious as it involved actual casting of the pieces in the molds. The process relies on a concept of making only the necessary amount of concrete mix that can be measured and weighed beforehand to have the concrete resistance of 250 kg/cm2. Having two molds speeded up the process to total of 18 casts – 1/3 with grey, 1/3 with black and 1/3 with white concrete tonality. First pieces seemed to have too little of the rough aggregate and did not feature any metal reinforcement inside, so a fine “rabbit” mesh was cut to fit the entire pieces and hold them together as it became an issue of fragility especially with the biggest element that is 57,7 cm long and has the thickness of mere 1,9 cm.

The entire process lead to a profound application of the zero-waste fabrication from beginning to the end, featuring low carbon footprint and keeping costs to just the simple basic ingredients of this design, most of them sourced locally from Monterrey, Mexico: cement – 50 kg standard and 25 kg white, sand and gravel aggregate - 6 buckets in total, fine “rabbit” mesh 4 m2, thin electric cable 20 AWG – spool of 100 m, open source Arduino Mega microcontroller, 5V transformer, some plywood, 3 kg of rubber molding material and 1 kg of resin with 10 ml of red pigment. Everything else counts as total of 40 hours of design and 80 hours of physical labor, including some programming and adapting of the Arduino code.

Additional health benefits and further research

In the process of doing the research for the best ever Finnish sauna, most of the decisions were made

Fig. 7. Casting first floor pieces in standard gray concrete [photo Arne Riekstins, 2021]

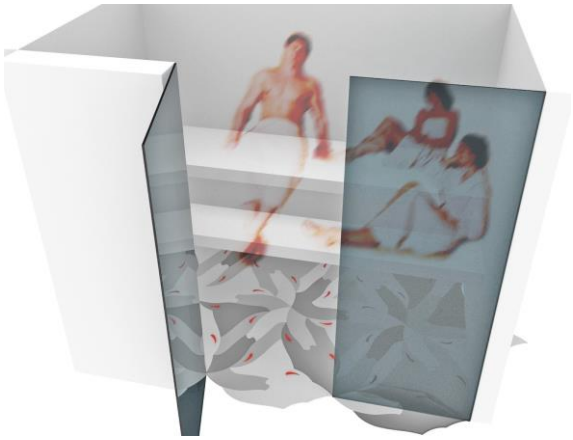

Fig. 8. Rendered architectural image of the parametric tiling pattern applied to the sauna floor [created by the author, 2021]

to improve its experience with any feature that could be related to the field. Red light apparently belongs to a category that gives notable health benefits. As it is a merely design feature, there still exist lot of research [2] about red light wavelengths in general. They are considered to increase the mitochondrial function of the cells, therefore producing more energy to the human body. Also, there is a long list of skin benefits – it repairs all sorts of damage caused from sunburns, scars etc. it also should reduce wrinkles, build collagen, perform detox and improve the blood flowing in veins. There are some studies of red light healing the age-related degeneration of the eyes [1], hormone benefits ... The list of the benefits goes on and on, where paired with a sauna experience they could be backing up each other's positive effects. As the research of health issues belongs already to other field, author sees it probable to link it to his future research, observing the best real-life practices and documenting the outcomes in an empiric way.

Further research could also be related to expanding the interaction of the Arduino microcontroller to more advanced AI behavior, linking the setup via wi-fi connection to an interface that could monitor the user's smart wearables like health-watches and make a connection with numerous available input sensors to set the red light illumination patterns to the equation of the sauna temperature, humidity, occupancy or mood (entertainment mode vs. healing mode). That would be the departure point of the possible scenario options for this research of Biodigital parametric tiling patterns for architecture.

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Kopsavilkums. Šajā pētījumā dokumentēti parametriski ģeometriskie raksti, kas atkārojas un veido neordināras figūras, un kurām ir plašs lietojums dažāda mēroga interjera un eksterjera arhitektūrā. Tiek apskatītas digitālās projektēšanas un digitālās ražošanas tehnoloģijas, kurām ir neierobežots ģeometriskais potenciāls, kas pilnveidojams ar sensoriem aprīkotiem mikrokontrolieriem, tiem piešķirot dažādas ar mākslīgā intelekta saistītas īpašības. Pētījuma materializācija veikta nelielā mērogā kā mozaīka no dažādas tonalitātes betona un polimēru inkrustācijas, papildināta ar zemas voltāžas diožu izgaismojumu, kas imitē sarkanu degošu liesmu.

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The contemporary churches in the natural environment: modernization of landscape traditions

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Abstract. The article analyzes and formulates the characteristic features of traditional Ukrainian landscape design, which had authentic roots and was based on minimal interference in the existing natural environment and its maximum use to enhance the properties of architecture. The purpose of the article is to identify traditional and innovative elements in the landscaping of modern Ukrainian Orthodox churches.The descriptive method, the graphical-and-analytical method, the methods of historical and comparative analysis were used. The main traditional methods of Ukrainian landscape design of the XVII–XVIII centuries are determined. Examples of traditional landscape design of Polish monasteries are given, taking into account the rather long influence of Polish culture on a large part of Ukrainian territories. The modern landscape techniques in Ukraine based on the use of folk traditions are described and analyzed. Two main directions of modern landscape design of territories around cult buildings are defined – repetition of the established receptions (in ethno-complexes) and creative modernization of architectural forms in combination with landscape design (on examples of newly built churches). It is shown how both methods enhance the properties and aesthetic expressiveness of architecture.

Keywords: historical landscape traditions, Ukraine, Poland, modernization, church-surrounding territories

Introduction

From ancient times in Ukraine great importance was attached to landscaping around the churches. Over the centuries, there has been a tradition to build an Orthodox church in the most advantageous place, in terms of picturesqueness and aesthetics of perception, so that the trees do not cover the church itself, but on the contrary, frame it like a frame frames a picture. This respect for the natural environment is due to its strong pre-Christian roots, when Slavic tribes worshiped sacred trees and believed that the natural world was inhabited by supernatural beings. That is why historically, even after the adoption of Christianity, the natural environment itself played an important role in Orthodox construction. Such accent natural components were steep slopes, banks of rivers and lakes, hills, cliffs, forests.

Objective judgments about how the parish influenced the perception of the image of the Orthodox church can be made on the basis of nineteenth-century literary sources, where various historians, writers, poets, and art critics have described ancient wooden churches. Most often, the church was placed not only on the highest place, but also on the banks of a river or lake, among the greenery and flowering gardens. If there were no such natural reservoirs, artificial ponds were created.

Landscape descriptions of churches among the natural environment in the works of T. Shevchenko, I. Nechui-Levytskyi allow us to imagine the natural environment in which there were wooden churches, and the descriptions of villages impress with their picturesqueness.

The description of a small, darkened by time old wooden church in the village of Hnyli Budyshcha in Zvenyhorod region in one of Taras Shevchenko's novels [1] testifies to the role of a well-thought-out natural environment as a supplement to the artificial environment, i.e. architecture where old sprawling willows and tall poplars combined with sunlight creates an unforgettable impression of an ordinary wooden church.

In his stories [2], I. Nechui-Levytskyi singled out the picturesque nature of the Dnipro with the alternation of mountains and valleys with gardens, among which white houses peek out and old wooden churches with tower tops seem to float over the greenery.

Particular attention was paid to landscaping in monastic complexes – both urban, as Kyiv-Pechersk Lavra, and suburban, as Mharskyi monastery, Exaltation of the Cross monastery in Poltava, Kytaivska or Feofanivska hermitages. All these monasteries are still active today, and we can analyze how positively the natural environment affects the architecture. As you know, in ancient times the steep right bank of the Dnipro was crowned only by the most important churches – the Assumption Cathedral and the Great Bell Tower of the Kyiv-Pechersk Lavra, Military-St. Nicholas Cathedral, St. Michael's Golden-Domed Cathedral, St. Andrew's Church.

Fig. 1. Exaltation of the Cross Monastery in Poltava (view from Ivanova Hill) [photo by A. Dmytrenko, 2021]

Also on a steep hill away from the buildings of Poltava is located among the greenery of the Exaltation of the Cross Monastery, which can be seen from a distance and which is especially impressive from the observation deck of Ivanova Hill (the place where one of the bastions of the Poltava town fortress was located in the 17th – 18th centuries) [3], where white walls and golden domes grow among the dense greenery (Fig.1). In large cities like Kyiv, it is often not possible to preserve this tradition of the absence of other high-rise buildings near the temples, which is especially noticeable in the new churches on the Left Bank, around which there is almost no landscaping, and their walls surrounded by high-rise buildings seems small toys.

Information about the traditions of landscaping of old Orthodox churches and monasteries of Ukraine can be obtained from drawings and descriptions of de la Flise [4], H. Pavlutskyi [5], S. Taranushenko [6], F. Vovk [7], N. Zakrevskiy [8], as well as modern authors – D. Chernyshev, M. Dyomin, A. Dmytrenko, Yu. Ivashko, J. Kobylarczyk, D. Kuśnierz-Krupa, M. Orlenko [9 – 14]. At the same time, it should be noted that the topic of landscaping of old churches in Ukraine is still insufficiently disclosed and needs further study. Thus, de la Flise, a doctor by education, left behind several manuscript albums with pictures of villages, H. Pavlutskyi, S. Taranushenko were primarily interested in the architecture of temples and antiquities, N. Zakrevskiy – the history of outstanding temples, F. Vovk – folk life and ethnographic component. The landscape aspect is more widely covered in the publications of contemporary Ukrainian and Polish authors, who paid attention to the natural environment, including the man-made one, of the Ukrainian orthodox churches.

However, the realities of modern life have changed the appearance of Ukrainian cities and villages, and the preservation of established traditions of the natural environment can be said only in the case of suburban monasteries and churches in the Carpathians, as there is a constant onset of building and reducing green spaces around temples. That is why it is important to consider and analyze examples of modernization of historical landscape traditions in accordance with today's conditions.

Matherials and Methods

Traditional scientific methods such as descriptive method, graph-analytical method, methods of historical and comparative analysis were used for the research. The descriptive method was used to describe ancient and modern examples of landscaping around temple areas, the graph-analytical method was used to analyze drawings of modern temples, the method of historical analysis allowed to determine traditional Ukrainian landscape techniques in landscaping of temple areas, the method of comparative analysis allowed to compare modern landscape receptions and among themselves and the effect obtained.

Results and Discussion

Historical traditions of Ukrainian landscape design

As already mentioned, over the centuries, historical Ukrainian landscape traditions have developed, the development of which crossed the classicism of the late eighteenth century, which brought fashion to regular parks and romantic pavilions. If we analyze the Ukrainian landscape traditions before the appearance of regular parks, such as Sofiivka, Oleksandriia, Sokyryntsi, they were simpler and as close as possible to nature.

If we analyze the landscaping around the main village building – the church or around the cathedrals of country monasteries, it was a combination of trees of a certain region with water bodies and traditions stylistically close to the so-called "English parks". This can be clearly seen in the examples of the Mharskyi monastery, the Kytaivska and Feofanivska hermitages, village churches surrounded by fruit trees and flower beds.

And here it is worth mentioning certain folk beliefs, which concerned certain species of trees and which were mentioned by the famous ethnographer Fedir Vovk and which give some explanation of the tradition of minimal interference in the natural environment.

In particular, the longevity of pine was popularly explained by the fact that pine is a blessed and therefore evergreen tree, because its tree was unsuitable for nails for the crucifixion of Christ, and willow is a cursed tree, because those nails were made of it; according to legend, the traitor Judas hung himself on an aspen, and because of this its leaves flutter all the time. There was a similar respect for water, which also explains the prevalence of the theme in the works of orature. Since the baptism of Kyivan Rus did not completely eradicate pre- Christian beliefs and mystical ideas and they continued to

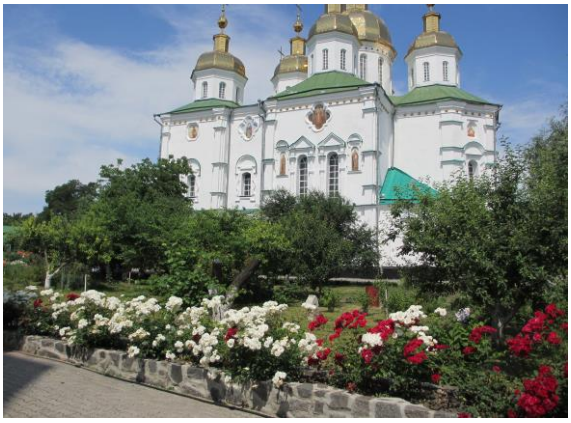

Fig. 2. The orchard in the Exaltation of the Cross Monastery in Poltava. [photo by A. Dmytrenko, 2021]

exist in the villages in the early twentieth century, this was reflected in a certain conservatism of landscape traditions in the countryside or in small towns.

Thus, on the basis of the analysis of villages drawings by D.P. de la Flise, scientific publications of H. Pavlutskyi, S. Taranushenko, F. Vovk, N. Zakrevskiy and full-scale researches of authors it is possible to define those characteristic features of landscape design which have developed in Ukraine during Hetmanate and not were borrowed from outside:

1) the dependence of architecture on the natural environment and subordination to it and the emphasis on the accent landscape of the most important buildings;
2) the natural factor often becomes the primary choice of place for the foundation of a monastery or the construction of a church (elevated place, proximity to water, fertile soils, favorable climate);
3) obligatory inclusion in the zones of the monastery complex of the orchard as a sacred symbol of the lost paradise with certain trees-symbols of moral virtues, a garden, flower beds (Fig. 2);
4) terrace-like layout of country monastery gardens with a system of stairs and transitions between levels and observation decks;
5) creation of chamber separate landscape scenes for prayer in solitude;
6) strengthening the steep slopes of the monastery areas with orchards;
7) the use of natural springs to create artificial ponds and lakes, the location of the main temples so that they are reflected in the water surface below them, with the arrangement of a system of paths between the lake or river and the territory of the monastery;
8) the formation of landscape paintings of several levels – from the water or valley, as you climb the hill, from the upper edge of the hill (classic examples are the Chinese desert, Svyatohirska Lavra and Kyiv-Pechersk Lavra);
9) giving especially picturesque local landscapes biblical names, generated by certain analogies, giving the trees near the temples a certain sacred meaning, often associated with the name of the temple or the history of its origin (invention in 1060 of the miraculous icon of the Blessed Virgin on the spruce and founding Yeletskyi monastery in Chernihiv, a tree with three trunks in the Kytaivska hermitage as a symbol of the Trinity, etc.);
10) application of two main landscape techniques – when around the main buildings there is an open space without greenery, which allows you to view them from different points and from a distance (Feofanivska Church of the hermitage of the same name, Transfiguration Cathedral of Mharskyi Monastery and bell tower) a lot of greenery and it is impossible to see the whole temple, even from a distance, (Exaltation of the Cross Cathedral in Poltava, Trinity Church of the Kytaivska hermitage).

Camaldolese monastery complex in Cracow's Bielany

Characteristically, the most secluded monasteries have always been in the middle of untouched nature, away from the settlements, in a quiet place, which provided a life in silence. This tradition is characteristic not only of the Orthodox hermitages and deserts of Ukraine. A striking example is the Camaldolese Monastery near Cracow (Kongregacja Eremitów Kamedułów Góry Koronnej. Erem Srebrnej Góry) (Fig.3). This order is marked by a special austerity of the charter. The monastery complex is located on a high hill and surrounded by forest. Narrow roads lead to it among dense trees, but closer to the complex the forest recedes and behind a large open area the walls and domes of the temple open. Landscaping of the monastery is quite simple – green grass lawns and a few trees. Monks live in small houses with gardens.

One of the most interesting and culturally valuable church and monastery complexes in Poland is the Church of the Assumption of the Blessed Virgin Mary with the hermitage of the Camaldolese monks, located in Cracow-Bielany. The complex is located approximately 7 km from the centre of the medieval orthogonal urban layout of the city of Cracow [15], in a picturesque area on Srebrna Góra, in the Vistula River valley. It is surrounded by a vast forest with pathways and places for contemplation.

The history of the monastery began at the beginning of the 17th century, when the Grand Marshal of the Crown, Mikołaj of Podhajec Wolski, brought the first monks here. It is worth recalling that the rule of the Camaldolese Order is very strict, based on the rule of St. Benedict.

The complex consists of the aforementioned church of the Assumption of the Blessed Virgin Mary, the construction of which began in 1609 and was completed in 1630; and the monastery, the residential part of which was erected in the years

Fig. 3. The Camaldolese monastery complex in Cracow's Bielany [photo by M.Krupa, 2021]

1605–1609. To this day, monks have been living in small houses – hermitages or in single monastic cells.

The monastery was built on a similar principle to the Italian monasteries. The design uses the principle of spatial symmetry and the location along the east-west axis. The interior of the church is decorated with stucco by Jan Baptista Falconi, and paintings by Tommaso Dolabella and Michał Stachowicz. Two courtyards: the north and south, were designed next to the church. In the centre of the first there is a well, and it is suriounded by monastery buildings with a refectory and a kitchen. A guest house was built next to the second one. In the remaining area a solitude zone was planned, in which houses were built in rows – hermitages where the monks live [16 – 19].

This hermitage complex, located on a hill, despite a certain "separation from the world" related to the convent's rule, is visible from many locations in Cracow and is one of the undisputed landmarks in the city's cultural landscape.

Mhar Monastery as an example of traditional monastic landscape design

A typical traditional example of monastic landscape design in Ukraine is the Mhar Monastery with the Church of the Annunciation. Since the hermitage is traditionally a place of special prayerful solitude in nature, the modern landscape design of this area is also aimed at creating an appropriate prayer atmosphere and harmony with nature. Small compared to the main cathedral, the white temple with a blue roof stands on two stylobates – a natural green hill and a high ground floor, ie the entrance to the temple is on the stairs.

There are no tall trees around the temple, which reveals its architecture from a distance, as well as in front of a small chapel and spring. Here we have already used the technique of the open space around the temple by reducing the height of plants in the direction of the temple: right next to the church there are only green grass lawns and bright flower beds. To achieve the impression of maximum naturalness of the environment, all paths are covered with grass, from the gate of the hermitage to the church there is a green path, on both sides of which there are flower beds of traditional Ukrainian garden irises – "roosters", behind which grow young pines. In addition to new coniferous and deciduous trees, old trees – oak and pine – have been preserved. On the territory of the hermitage there is a green recreation area with several flower beds, a grass lawn and low-growing plants. Alleys are laid along the territory, surrounded on both sides by thuja and lilies "royal crowns". In front of the cells in the hermitage there are flower beds made of traditional Ukrainian garden red poppies and garden irises.

Thus, it proves that in the authentic, not borrowed from Europe or Russia landscape design of Ukraine the main role was given to the maximum preservation of the existing natural environment and the use of its properties for the expressiveness of the artificial environment – architectural objects. There were two main techniques – open spaces without greenery around the main temple buildings and partial enclosed spaces and planting trees around the temples, which created the effect of intimacy and solitude in nature, but made it impossible to create landscape paintings with the disclosure of a considerable distance.

Revival of Ukrainian folk landscape traditions in the ethno-complex "Ukrainian village"

The revival of these traditions of maximum non-interference in the existing natural environment and the subordination of architecture to it is one of the directions of modern Ukrainian landscape design in ethno-style. Classic examples are the first-born ethno-complexes – the famous open-air museums in Pyrohovo and Pereiaslav.

Like other countries, the creation of ethno-complexes in national traditions, with relocated historical or reconstructed Ukrainian houses with household items and wooden temples in national traditions, counteracted the tendencies of globalization in Ukraine with the erasure of national features in architecture and landscape design. One of such ethno-complexes is the ethno-complex among the natural pine forest "Ukrainian Village", founded in 2008 and located 15 kilometers from Kyiv on the Zhytomyr highway, in the village of Buzova. According to L. Pokhylevych, the village got its name from a wild elder, which once grew densely in the valley where the village is located. The area of the ethno-complex is 3.5 hectares. The purpose of creating such an ethno-complex was to revive modern Ukrainians' interest in folk traditions and folk festivals that take place on the territory of the ethno-complex.

The authenticity of this ethno-complex is given by its subordination to the natural environment: in the middle of the pine forest there are log wooden buildings, and the complex itself is surrounded by

a low wooden fence, near which thuja trees are planted.

The territory is divided on three parts: the territory of the museum, the territory of the existing temple, the recreation area. There is a functioning museum, service facilities (mini-hotel and restaurant), a forest park with a mini zoo and the wooden church of St. Demetrius of Thessaloniki.

In fact, this ethno-corner of old Ukraine was created on the model of the famous ethnographic open-air museum "Pyrohovo" in Kyiv, but it is more compact and as a result makes a more cozy impression. As in the open-air museum in Pyrohovo, different regions of Ukraine are represented here, six old houses from the regions of Polissia, Podillia, South, Slobozhanshchyna, Carpathians, Serednia Naddnipranshchyna, the oldest of which is almost two hundred years old, with corresponding old utensils were installed on the territory. The maximum naturalness of the environment gives an authentic impression, traditional Ukrainian plants grow around the houses – pines, maples, birches, viburnum bushes. Traditional Ukrainian flowers are planted along the paths – marigolds and strips of funk, garden lilies. There are also traditional Ukrainian apple orchards on the territory of the complex.

As already mentioned, since pre-Christian times, the Slavs believed in the healing properties of trees, and among them were conifers, so it was believed that living in a dry light pine forest has a positive effect on health. Staying in a pine forest is especially useful for people with breathing problems. That is why it is no coincidence that the landscaping of the complex is dominated by natural coniferous trees – pine and planted – thuja and juniper.

An important place in the planning of the territory is occupied by recreation areas, gazebos, playgrounds. To achieve an authentic fusion with nature, all the elements in them are made of wood. Paths paved with natural stone, surrounded by pine trees, lead to the exhibits – houses and utility rooms and workshops. A separate area where folk crafts are presented, called the "Town of Masters", it is highlighted by the fact that around the paths grow only old pines and birches and there is no low vegetation, so all the buildings are perceived from a distance. In addition, the availability of open spaces is due to the fact that there are wooden benches and tables near the houses and outdoor workshops on folk crafts are held, so there are crowds of people and, moreover, sufficient lighting is required.

Part of the ethno-complex is occupied directly by the ethnographic museum with houses, outbuildings and workshops, there are thematic tours "Architecture and life of rural housing in Ukraine in the late nineteenth century", master classes in folk crafts, mini-shows on pottery and blacksmithing, and also a mini zoo. Wooden mud-passages, a characteristic element of the Ukrainian estate, add authenticity. There are also greenhouses with tropical plants.

Fig. 4. The Church of St. Demetrius of Thessaloniki in the ethno-complex "Ukrainian village" [photo LICENSEARCH, 2019]

Near the ethno-hotel in five houses with all amenities and a restaurant is a small zoo, which presents the traditional Ukrainian rural livestock – sheep, piglets, wild boar, rabbits, nutria, pheasants, chickens and roosters, on the lake with fish – ducks and black swans.

Around the mini-zoo under the pines there are flower beds with red dahlias and sage, traditional Ukrainian mallows. The lake plays an important role in the planning of the territory, it is surrounded by pine trees, and in the middle there is a landscape wooden gazebo connected to the shore by a bridge.

Thus, the common eastern term "water pavilion" can be adapted to such a gazebo, as such pavilions were always located in the middle of the pond, were open, connected to the shore by a bridge and were designed to admire the shore, waterfowl and fish. Not far from the gazebo on the water there are houses for nesting black swans and ducks.

The lake and meadows become part of the rite for Ivan Kupala – an analogue of the Latvian pre-Christian holiday Ligo with the same meaning.

The peculiarity of natural motifs in the ethno-complex is that all the buildings are among the traditional non-man-made Ukrainian landscape, but there are greenhouses with exotic tropical plants – from the family of banana, citrus, fig.

As in the traditional Ukrainian village, the main building of the ethno-complex is the church of St. Demetrius of Thessaloniki, built of spruce wood (Fig.4).

The alley, surrounded by low coniferous trees, leads from the temple to the wooden gate bell tower, the main entrance to the ethnographic complex. Next to the temple is a healing natural spring.

The temple stands on a bright lawn, surrounded by tall pine trees. Low coniferous trees are planted near the temple, which do not cover it, the whole wooden temple itself seems to merge with the natural environment.

The area around the church is designed in such a way as to allow a roundabout, rites and at the same time not to cover the entire volume of the church,

so the closer to the temple are greenery, the lower they are, and near the walls seem to spread on the ground.

The presence of open space in front of the church has historically been determined by the need to hold processions around the church, consecration of water at the Epiphany, Easter cakes and Easter eggs, honey, flowers, wheat, fruit for the Honey and Apple Feast of the Saviour.

The main entrance to the church is decorated with bright flowers in hanging pots.

Thus, the main techniques of landscape design in ethno-style, which are used now, are as follows:

- use for landscaping only trees and flowers of the region where the ethno-complex is arranged;
- maximum preservation of existing trees and greenery on the site;
- use of water bodies – natural or artificial with gazebos on the water;
- subordination of the architecture style to the natural environment, dominance in the architecture of wood, shingles and straw roofs, traditional or modernized traditional folk forms;
- alternation of open spaces with low plants and closed spaces;
- design of recreation areas in ethno-style, from natural materials.

Modernized landscaping of modern temple areas: the experience of Scientific and Design Bureau "LICENCEARCH"

In modern conditions, there are two main lines of development of Orthodox church building: one – strictly canonical, built solely on continuity with the past, replication of forms of past centuries, the second – innovative, with a simultaneous combination of canonical elements and innovation within the canon, including landscape design. And if in ethno-complexes the natural environment actually determines the image and material of the church, the location of the new church on the plain opens up greater opportunities for a combination of greenery and architecture.

With certain reminiscences of individual elements of facades in Orthodox churches and temple complexes Scientific and Design Bureau "LICENCEARCH" (author of the project – O.S. Sleptsov) there is no direct copying of historical samples inspired by the architect, but modified national Ukrainian styles are used and attention is paid to design. The specificity of design solutions is that they are a bold experiment with the form of the plan, which, on the one hand, remains in line with Orthodox canons, and on the other is innovative, modern, non-archaic. The following list of modern temples plan types is used: rotunda in various variants (main), as a rule – on a stylobate with a possibility of a circular bypass (columnless, perimeter, with a colonnade on perimeter, with

Fig. 5. Landscape design of the Saint Nicolas Temple Complex in Deimanivka village [project of LICENSEARCH]

bypass gallery) – dominating type; square (columnless and columnar); octagonal (columnless and columnar); cross-domed; cross (pillar, with stylobate); rectangular; two-part; three-part; nine-part; basilica; centric (columnar and columnless); "ship" (in the form of a ship); temple-bell tower; composite. The design of a modern Orthodox church requires the use of modern materials and structures. Achievements of the architectural and construction industry allow erecting walls not only from a traditional tree, a stone, a brick, but also from reinforced concrete, to apply metal designs of a framework, covers, to apply new roofing materials.

The material of construction of the temple determines the nature of landscaping and greening.

The practice of forming temple complexes developed by a set of functions is widespread, which affects the development of the master plan. Now the functions of the Orthodox church are much wider, the church becomes the center of spiritual and cultural life of the faithful and may include additional functions – educational, museum, ethnographic, memorial, charitable, as part of the church complex there is a Sunday school with library, refectory, xenial, house parable, workshops, circles, lecture halls, bakeries, etc.

The functional and sacred content of the term "Orthodox temple complex" was reconsidered in accordance with today's conditions, when new functions, including a sports zone, appeared along with the historically present functions. This modernization of the set of functions of the Orthodox church complex means its importance both as a spiritual and cultural center and an important element of the urban environment (which

Fig. 6. Church of All Saints of the Ukrainian Land in Myronivka in the structure of the city park [photo LICENSEARCH, 2019]

Fig. 7. Natural environment of the church in the village of Oleksandrivka [photo LICENSEARCH, 2019]

is why such considerable attention is paid to the peculiarities of location and choice of construction site).

Scientific and Design Bureau "LICENCEARCH" developed a project to build Saint Nicolas Temple Complex in Deimanivka village, Poltava region in combination with the development of landscaping (Fig. 5).

The plot, unlike the previous ethnographic complex, is located on an open plain, near the river, among traditional rural buildings and fields. The prototype was the ancient monasteries, strongholds of the Middle Ages, surrounded by walls with towers with helmet-shaped ends at the corners.

The territory of the complex is also surrounded by such a symbolic wall with a number of towers. The main building is the temple itself, in front of which there are open green spaces. The rotunda plan of the temple caused the curvature of the outlines of the paths. The author of the project O. Sleptsov suggested landscaping the area with low trees, which will allow inspecting the architecture of the temple from a long distance. The plot is a triangle with one almost right angle. In the smallest corner is the main entrance to the complex, franked by two towers, with a small offset from the axis of the entrance is the temple itself, the view of which is fully revealed from the entrance.

Since the temple is a rotunda, it has no direct paths, so from the entrance to the temple the visitor goes through an intermediate viewing platform of a round shape, and the closer he approaches the temple, the angle in which he sees the temple and surrounding trees changes several times.

The theme of the modern wooden church as a combination of traditional building material and modernized forms of Ukrainian folk architecture is continued in the churches of Oleksandrivka in Kyiv region and the Church of All Saints of the Ukrainian Land in Myronivka (the project of Scientific and Design Bureau "LICENCEARCH", author O. Sleptsov). In both cases, the churches close the parks and become their main focus.

Since the plan of the Church of All Saints also begins in the form of a rotunda, this led to the planning of paths and space around the temple, which is dominated by semicircular forms (Fig. 6). The faceted outline of the church plan is enhanced by the curvilinear outline of the circular area around and the further paths and platforms, the clear geometry of which is enhanced by the trees planted around.

The temple closes the composition of almost rectangular in plan the main city park of Myronivka and is located on the side opposite the remote acute angle. The composition of the park uses the opposition of the densely landscaped part of the park and the open space close to the temple, with a grass lawn and several trees that flank the church on the sides. This technique allowed to emphasize the architectural dominance and at the same time by introducing the theme of green lawn and flower beds to include it in the park structure.

The merging with the natural environment is facilitated by the absence of very bright colors and the predominance of restrained warm ocher colors of natural wood, from which the church was built. The theme of unity with ancient traditions is continued in the interior, where the atmosphere of unpainted wooden log walls and corona lucis – "worldview" made of wooden carved elements in the form of stylized crosses is especially cozy. The compositional scheme of the corona lucis is four octagons – circles of the World, decorated with decorative Orthodox symbols with the functions of talismans. The unifying element of the corona lucis is an octagon with a stylized cross inscribed in it.

The number of circles of the corona lucis with a certain number of lamps includes Orthodox symbols: the first outer symbolizes the circle of the Father, the second circle – the circle of the Supreme Father, the third – the circle of the Supreme Father, the fourth circle – the circle of the Father and Lord. The circles are decorated with orthodox symbols carved in wood.

If in the church of Myronivka the technique of open space in front of the church was used, then in the church of Oleksandrivka a newly built wooden church stands in the open, but the park area with trees is close to it, and the spruce-shaped tier

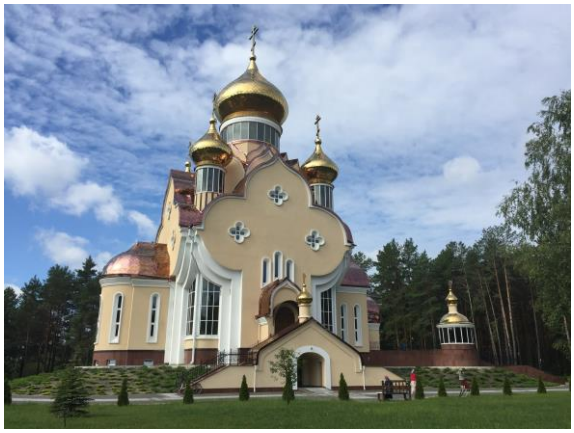

Fig. 8. St. Elijah's Memorial Church Complex in Slavutych [photo LICENCEARCH, 2019]

Fig. 9. Landscaping around the church of Sts. Apostles Peter and Paul at the Berkovetskyi Cemetery in Kyiv. [photo LICENCEARCH, 2019]

silhouette gives the impression of even greater merging with pines around (Fig. 7).

We can say that the plan of the church and the predominance of certain forms determine the layout of the surrounding area, the configuration of the paths, the type of coverage and the place of planting trees. The church is compositionally included in the structure of the village forest park with the burial of fallen soldiers.

Landscape design around the church in Myronivka gives the impression of man-made, around the church in the village of Oleksandrivka – untouched natural.

The form of the church of Myronivka derived from the rotunda determined the corresponding outlines of the paths. The square shape of the plan of the church in the village of Oleksandrivka determined the appropriate shape of the area around the church and the paths at right angles.

The open gallery around the church in the village of Oleksandrivka, which overlooks the forest park, is a continuation of the ancient Ukrainian church tradition of arranging galleries on consoles – attics or columns – "opasannia" for protection from the weather and the possibility of external ceremonies in bad weather.

A specific type of church is the so-called memorial temples in cemeteries or dedicated to the dead. This is the St. Elijah Memorial Temple Complex in Slavutych, dedicated to the victims of the Chernobyl accident on April 26, 1986 (project of Scientific and Design Bureau "LICENCEARCH", author of the project O. Sleptsov). Suddenly, the old pine forest separates and a spacious meadow opens, among which the temple rises (Fig. 8). Involuntarily mentioned analogy with the ancient Ukrainian hermitages and monasteries – Kytaivska and and Feofanivska hermitages, Mharskyi monastery.

In plan, St. Elijah's Church has a favorite rotunda shape by the author of the project, stylized motifs of crosses are used on the facade, and this theme of the cross is supported by the arrangement of frescoes in the interior. The temple stands on a stylobate.

The landscape design uses the traditional method of lowering the height of the greenery in the direction of the temple in order to fully reveal it.

An alley lined with thuja leads to it. Closer to the temple, the trees part and the temple opens on all sides on a green stylobate hill with two stairs. The natural frame of this landscape picture are the pines located on the edges of the meadow.

The main idea was to reveal the volume of the temple as visually as possible, along with the maximum preservation of the untouched nature of Polissya. That is why around it is a green carpet of lawns without tall trees.

A special place among the modern temple construction is occupied by the church of Sts. Apostles Peter and Paul at the Berkovetskyi Cemetery in Kyiv. The peculiarity of the temple is that it stands at the beginning of the cemetery and determines the nature of the entrance group (Fig. 9). The temple in the cemetery is a special Pantheon of the dead, so the layout of the adjacent area was also specific.

The rotunda temple stands on a kind of podium, which leads to the stairs, surrounded by several thuja and flower beds. Around the church – an open space with grass lawns is emphasized. In landscape design there is restraint, determined by the specifics of the place, and at the same time harmony. The curved neo-baroque forms of the church seem to grow from a green hill.

Behind the church in the middle of a green lawn with paths a playground is placed.

Conclusion

In the conditions of globalization and erasure of national features, including in landscape design, successful attempts to modernize Ukrainian landscape traditions while preserving their authentic character are observed. It is proved that the architecture of the wooden building has been rethought in a new way.

The example of the ethno-complex "Ukrainian Village" shows how a multifunctional complex with the function of a mini-open-air museum was created

on the territory of the pine forest, where such traditional Ukrainian landscape techniques as:

- use only of trees typical of the Dnipro region (pines, spruces, birches, maples) and plants (viburnum bushes, marigold flowers, dahlias, mallows, sage);
- maximum preservation of existing trees;
- subordination of the style of architecture and scale of all buildings to the natural environment, including through construction of wood;
- creation of picturesque pictures and perspectives exclusively by trees and plants of this region;
- inclusion in the composition of the lake with a gazebo in the middle;
- alternation of open and closed spaces;
- emphasizing the emphasis of the temple in the environment by appropriate location and application of the technique of lowering the height of plants in the direction of the temple and thus opening the temple for inspection from all sides.

If we analyze the images of all the wooden and stone temples of different regions and compare them with the architectural heritage of the past, we can draw the following conclusions.

In the objects of different ethnographic territories of Ukraine over the centuries (including the synodal period) regional originality determined their image, each region formed a certain system of defining features, which were most pronounced in wooden architecture, but took place in the architecture of Kyivan Rus, Renaissance and the so-called Ukrainian Baroque. For example, there are noticeable differences between the temples of the so-called. Ukrainian Baroque Kyiv, Chernihiv, Poltava, Slobozhanska regional schools (in plans, three-dimensional composition, forms of elements), but all together these regional schools are united by defining features in the enlarged Central-Eastern school (unlike the western, which was quite homogeneous, based on the traditions of the Catholic Baroque, but in a simplified version).

In the churches of different ethnographic regions of Ukraine, which were built according to the projects of O.S. Sleptsov, a noticeable tendency of modernized citation of historical forms characteristic of a particular region. Most often, various variations of the generalized image of the Ukrainian Orthodox Church are created, which is not rigidly tied to a particular region, as it is designed in forms that will not look alien to any territory of Ukraine, except where the region is historically dependent on established ethnographic canons (Transcarpathia, Bukovyna).

On the examples of all analyzed modern temples it is proved that in all cases the silhouette and image of the building was determined by the natural environment. Both identified traditional methods of Ukrainian landscape design were used – with an open space around the temple and the arrangement around only grass lawns and flower beds and with the maximum merging of the building with the trees, located quite close.

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Kopsavilkums. Rakstā analizētas un formulētas tradicionālā ukraiņu ainavu dizaina raksturīgās iezīmes, kurām bija autentiskas saknes un kuras balstījās uz minimālu iejaukšanos esošajā dabiskajā vidē un tās maksimālu izmantošanu arhitektūras īpašību uzlabošanai. Raksta mērķis ir identificēt tradicionālos un inovatīvos elementus mūsdienu Ukrainas pareizticīgo baznīcu ainavu veidošanā. Pētījumā izmantota aprakstošā metode un grafiski-analītiskā metode, kā arī vēsturiskās un salīdzinošās analīzes metodes. Tiek noteiktas galvenās tradicionālās ukraiņu ainavu dizaina metodes XVII–XVIII gadsimtā.

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Aspects of rural landscape planning related to abandoned places and objects

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Abstract. The study gives insight into the definition of abandoned places and objects in rural landscape planning. The goal of the study is to identify the essential aspects of rural landscape planning, that are related to abandoned places and objects, to use these findings from the literature review in further research already defining abandoned places and objects and giving guidelines for these kinds of places and object inclusion in planning documents. Rural landscape planning is considered to be the beginning of the development of planning, but planning issues have moved these days in the direction of metropolitan areas. There are still relevant initial planning goals in rural landscape planning - the creation of a quality living environment and job creation. Nowadays the importance of the landscape planning approach at the local level is emphasized. Rural landscape development and change processes are closely linked to the Common Agricultural Policy. Abandoned place/object in the context of planning can be considered as one that is not used for one year or more according to the defined function, or a place/object as abandoned, defined in human perception.

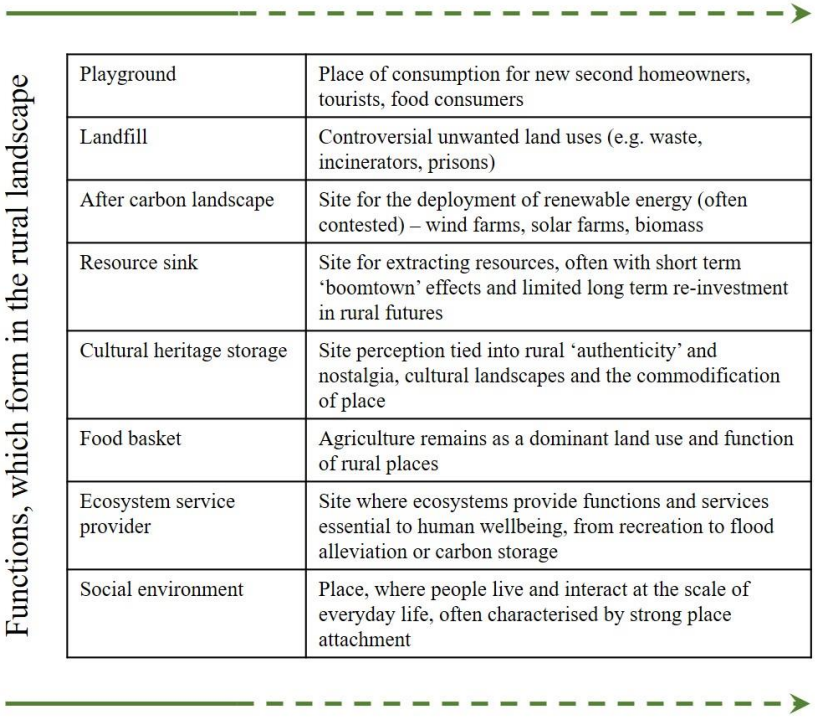
Keywords: rural landscape, landscape planning, planning aspects

Introduction

The number of people living in rural areas is expected to decline in the closest years, but those who still live in rural areas, and in the developed countries their number is increasing [24] need a good quality of life. Life quality in the countryside is influenced by many things, also different abandoned objects and places. Aspects of rural landscape planning can be seen in close connection with planning trends in general, the development of landscape planning, as well as the way a vision of landscape covered by science and planning has developed. Four sections have historically developed in the planning process: spatial; political; social and economic. Spatial planning in particular is linked to sustainable planning because it is linked to the restrictive, defining context of the area [2]. Geography is what has provided an opportunity to perform spatial planning and has changed planning in general at the beginning of the 20th century [46]. Planning is closely linked to research. In research of rural landscape, which was launched by geographers at the end of the 19th century, they took either a structural, functional, or archaeological approach. The structural approach includes each type of rural landscape and its historical development. The functional approach is focused on how each rural landscape is organized to combine plant and cattle farming. Meanwhile, the archaeological approach explores the existent features of the landscape that have formed earlier and reflect the previously prevailing functional conditions in the landscape [16]. Various landscape studies reflect the fact that the landscape has been created in an organized form and that studies also focus on the different principles of landscape building and organizing, development, affecting factors. As materials for research are used planning policy documents and mainly research papers, which reveal abandoned place and object relations to the rural landscape and specifics of rural landscape planning. Research is based on a literature review also covering some of the terms defined, in research was applied bibliographic sources, scientific publications, and electronic resources summary and analysis method.

Rural landscape function change

Landscape issues must be integrated into agricultural policy in the Member States of the EuropeanUnion, this requires professionals trained in holistic thinking [26]. The emergence of potential new functions for rural landscapes (Fig. 1) is essential to understand the challenges and results of planning future rural landscapes. Nowadays, there are highlighted several functions in the rural landscape that are currently not exactly predictable in terms of future development. Highlighting the existing functions at the development stage is essential in creating the future vision of the specific area, development scenarios. The new functions that these days are highlighted in the European context are defined under such headings as “playground”, “landfill”, “after carbon landscape”, “resource sink”, “cultural heritage storage”, “food basket”, “ecosystem service provider” and “social environment” [22].



Playground	Place of consumption for new second homeowners, tourists, food consumers
Landfill	Controversial unwanted land uses (e.g. waste, incinerators, prisons)
After carbon landscape	Site for the deployment of renewable energy (often contested) – wind farms, solar farms, biomass
Resource sink	Site for extracting resources, often with short term 'boomtown' effects and limited long term re-investment in rural futures
Cultural heritage storage	Site perception tied into rural 'authenticity' and nostalgia, cultural landscapes and the commodification of place
Food basket	Agriculture remains as a dominant land use and function of rural places
Ecosystem service provider	Site where ecosystems provide functions and services essential to human wellbeing, from recreation to flood alleviation or carbon storage
Social environment	Place, where people live and interact at the scale of everyday life, often characterised by strong place attachment

Fig. 1. New functions created in the rural landscape [developed by the author by using Gallent, Scott 2017]

In 2017 ICOMOS (International Council on Monuments and Sites) and IFLA (International Federation of Landscape Architects) have jointly formulated principles related to the rural landscape as an essential part of human heritage. It is important to note the importance of traditional farming management, which is assessed at the international level since territories with a symbolic value of traditional farming management play an important role in the context of cultural landscapes and global heritage [29].

The Common Agricultural Policy, which started in 1962 at the European level, is essential for the development of the rural landscape. One of the five tasks of the Common Agricultural Policy is to preserve the rural nature and landscape of the European Union. In the context of this policy, it is stressed that farmers in particular are essential to the preservation of the landscape. Various initiatives at the European level are essential in the planning of rural landscapes in the context of spatial planning policy. Three major European initiatives affect spatial development planning: cohesion policy, rural development policy, and transport policy. The key initiatives of rural development policy are EAFRD (European Agricultural Fund for Rural Development) and LEADER. The European Investment Structural Funds play an important role in these initiatives. EAFRD Regulation No. 1698/2005 supports the development of local development strategies and plans, including urban-rural links, as well as supporting investment for the creation of basic infrastructure in rural areas. And one of the most important initiatives supported by the European Investment Structural Funds is the LEADER/SVV LEADER approach. LEADER is a local development method that is aimed to involve local activists in participation in the development of strategies, decision-making, distribution of development resources in rural areas. These days this method is widely used among the Member States of the European Union and more than half of the rural population is involved in the activities of this method. The second section of this method, SVVA, is a community-led local development and is applicable not to rural areas [17].

Factors affecting the formation of abandoned areas and objects in the rural landscape

Development processes of the rural landscape are influenced by global processes that reverberate across Europe through the prism of the European region. In each country and region, landscape changes proceed differently, but there are still common trends observed in paradigm changes. Cultural landscapes are the result of human and natural interaction. If we look at landscape changes in the context of human influence then they are defined as cultural landscapes. The concept of cultural landscape occurs in research by various scientists, both geographers and landscape scientists, architects and cultural historians, as well as it is defined in planning documents [6; 25; 27; 30; 47].

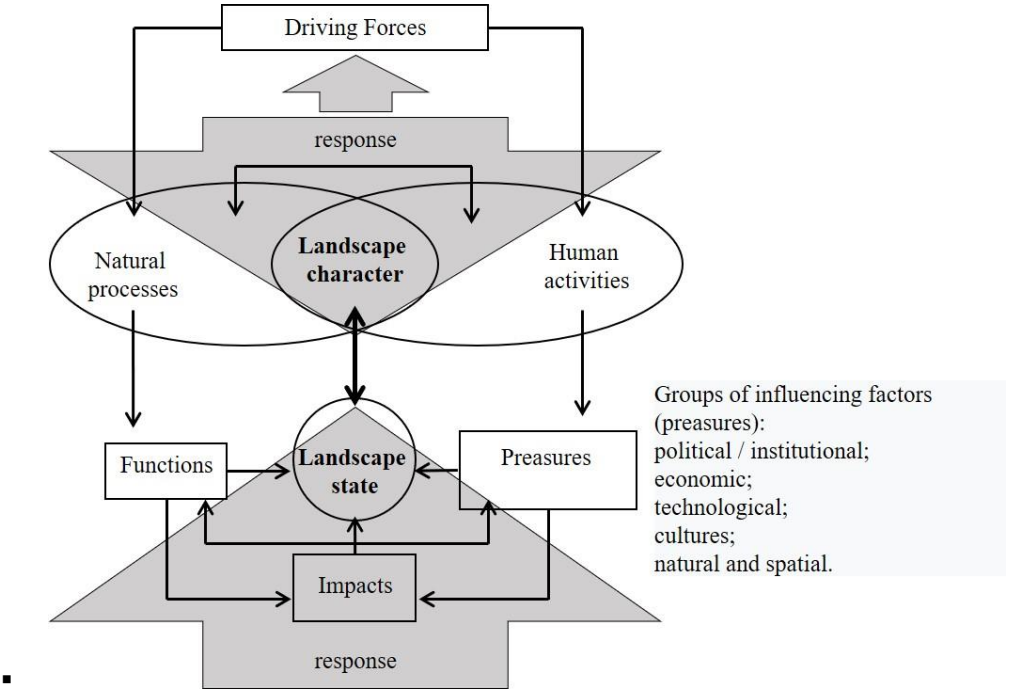


Fig. 2. Construction of impacting force, pressure, position, impact, feedback of landscape and main groups of factors affecting changes of landscape position [developed by the author by using Wascher 2004; Plieninger et al. 2016]

In the context of planning policy, the landscape has become important not only by implementing a landscape approach as a comprehensive vision of development but by strengthening the role of the landscape in the European Landscape Convention particularly. On defining the landscape as important for the existence and development of people the issue of landscape changes and their affecting factors raises [23].

Five major groups of influencers of landscape changes are distributed (Figure 2.):

- political/institutional (including agricultural and forest policy, spatial development policy, land tenure rights);
- economic (including structural changes in agriculture, prices of agricultural production, market changes);
- technological (including modernization of social and land management);
- cultural (including demography, attitudes, behavioral change);
- natural and spatial (including climate, topography, and spatial construction) [38].

Research of landscape formation includes a study of different processes. These days, one of the processes still widely affecting landscape changes is urbanization, whose impact continues to grow from the end of the 19th century [3; 4]. Dramatic changes in rural areas, countrysides, and the lifestyle of the rural population are currently taking place around the world, affecting cultural landscapes [42]. In the last century, urbanization processes and rural development policies have given rise to the polarisation of land usage, resulting in that the structure of populated areas has changed and population density has decreased, agriculture has activated in more productive and accessible areas, while distant peripheral areas were marginalized and abandoned [5; 32; 33; 42]. One of the processes often mentioned in the context of an abandoned landscape is a change in the population base. Going into the various studies, the information is not unequivocal. More and more people are moving to cities. In 2018, 55 % of people worldwide lived in cities, and two-thirds of the population of the planet are already expected to live in cities in 2050 [41]. In Europe, 75 % of the population lived in the cities in 2019 [48]. An important aspect is that the global population is growing rapidly in populated areas, but it only falls very marginally in rural areas – countryside, however, the number of people living in rural areas – the countryside is expected to decline in the coming years. In turn, another study shows that more than three billion people live in rural areas – countryside in the developed countries and their number is increasing and is expected to grow by 2028 [24].

The direction of landscape change expressed these days is homogenization when the landscape loses its individual character. The main processes affecting homogenization are economic development and migration [35]. Abandonment of the areas, land extension, urban expansion, and infrastructure development is a driving force of land changes and it is affected by the relevant policies of the European Union, although policies are not primarily designed to influence land management in principle. In the 21st century in Europe, there are

distributed two distinct periods for changes in the land cover. The first period, which has already started at the end of the 20th century and is defined from 1990 to 2006– abandonment of lands or development of agricultural lands towards marginalization had been pronounced during this period. The second period 2006-2012 – this period is characterized by a slightly faster decline in agricultural lands compared to the previous period and there had been either observed the formation of abandoned areas. Abandonment of agricultural areas forms a close link with the disappearance of traditional farming [45; 49].

While abandonment is an aspect influencing landscape, its reasons may vary from one area to another. One of the most expressed reasons for the abandonment of the land is the expansion of agricultural lands, other reasons include conflicts created by different functions, the polarisation of activities, and, often, the linkages created by several factors [38]. The reasons for the abandonment of agricultural lands are divided into three types: ecological, socio-economic, and incorrect or unsuitable agricultural systems, including inappropriate management. Such factors of abandonment of agricultural lands as fertility, soil depth, erosion, climate, etc. are classified to the ecological type. Factors for the abandonment of socio-economic type are migration, industrialization, technology, age of farmers, accessibility (roads), urban proximity, etc. In turn, third-type factors (incorrect or unsuitable agricultural systems) are generally described as farming which leads to soil degradation, increased risks of flooding, too intense use [10].

A summary conducted in 2016, which analyzed 144 studies, shows that abandonment is the most important factor influencing landscape change (62 % of the cases studied) [38]. In Europe, landscape abandonment had been the most mentioned trend between 1990 and 2006 [31]. Landscape abandonment can have both positive and negative impacts on biodiversity, ecosystem services, and the human well-being of certain areas [28; 37; 38; 40]. Abandoned areas and objects lead to a loss of cultural and aesthetic values in the landscape, as well as a decline in the diversity of the landscape. Although agricultural lands are linked to continuous wide fields, their abandonment leads to the rapid spread of invasive species, thereby reducing the diversity of the landscape of specific areas at least during the initial period. Recovery of the natural ecological system is possible after a certain period of time [10]. Abandoned areas and buildings have a negative psychological and economic impact on the remaining population of the area. Around the village areas, the population perceives an abandoned landscape regretfully. Visitors of the area also perceive regretfully the loss of cultural values in the rural landscape, while at the same time seeing the positive in wilderness distribution [34]. The attitude of society towards abandoned agricultural lands is mostly negative and associated with non-farming, as well as concerns or doubts that landscape is not being exploited productively [43]. Abandonment of the land, particularly abandonment of well-used grazing areas, can lead to the disappearance of the special habitats typical for such areas. However, there are many ecosystem services provided by abandoned rural landscapes, particularly indirect and unused services, which are often overlooked in the policy-making process. Ecosystem services support functions may lay the grounds for some cultural services since some species benefiting from abandonment are associated with recreation in hunting and tourism [46].

The Food and Agriculture Organization of the United Nations assesses the abandonment by defining the positive and negative impacts. The negative impacts are:

- Environmental impact – land degradation, landscape change, a decline in biodiversity and genetic resources;
- Economic impact – infrastructure deterioration or disappearing (roads, melioration), a decline in land value;
- Social impact – society division, marginalization, negative migration.

In turn, the positive impacts created of abandoned areas are the only increase in naturalness:

- Environmental impact – increase in environmental and landscape values through the return of areas to their natural condition. The development of a positive scenario requires a variety of contributing factors and it is not easily achievable if the area plays a major social and cultural role.

It is mentioned indeed on landscape changes that they are likely to develop negatively and positively over a larger period of time [21; 20]. Types of factors for farming abandonment can be divided into geographic, demographic, agro-ecological, socio-economic, policies of different-level, and historical (Table 1) [39].

Abandoned areas and objects are not only the result of any process, they form feedback and have an impact on the future development of a particular area. Abandoned farms in Europe have an impact on several land usage types. Areas considered as risk areas in England, France, Germany, Denmark, Italy, Lithuania, and the Czech Republic are lawns. In turn, mountain areas in some countries are risk zones [39]. The effects of farming (single houses) abandoning are wider than those of agricultural land abandonment factors, which is due to close links with the population of a particular area.

TABLE 1

Reasons and types of farming abandonment [Pointereau et al. 2008]

Type of factor	Reasons of farming abandonment
Geographic	▪ Steep embankment ▪ Distance of the farm from the field ▪ Low accessibility ▪ Small size of land parcel
Demographic	▪ Reduction in the number of workers ▪ Reduction in professional farmings ▪ Population change (immigration, emigration)
Agro-ecological	▪ Barren soil ▪ Land is used as Alpine pastures ▪ Small land parcels
Socio-economic	▪ High cultivation costs and low harvest potential ▪ Decrease in livestock numbers ▪ Low land price ▪ Farmers who are approaching the retirement age without followers (descendants) ▪ Complex inheritance due to generational disagreements ▪ Improved succession due to intergenerational discord ▪ Very small farms
National and European Union policies	▪ New sanitary requirements from the Common Agricultural Policy in Eastern European countries since 2004
Historical	▪ For Eastern European countries – transition to a free-market economy with crushing of the agricultural economy between 1990 and 2004

Integration of abandoned places and objects in planning

The concept of abandonment is not precisely territorially definable, but is more related to perception and is defined through comparison of areas. Abandonment occurs when, compared to the other areas, there are fewer people, fewer human-created elements, less visible human activity in a separate area. The perception of places and thus abandonment is subjective and deeply linked to how the place is imagined. Abandonment is not a lack of physical content (real or imagined) but a condition that assigns a value to the space. When determining the conditions of the place and comparing the indicators, the abandonment of the place becomes an objective value. The area must be defined as a social formation that is constantly transforming [15].

The concept of abandonment cannot be defined very clearly, unambiguously. The definitions of "abandonment" are different, having in common the efforts to define the various reasons for abandoning places and objects, as well as to define the time dimension for these processes. In the time dimension, the deadline is surprisingly starting at 12 months, if the place or object is unfunctional and not managed for a year, it must be defined as abandoned. The year is considered to be the reference point for defining that a particular area has been abandoned, remaining without function/usage [1; 2; 12]. The phenomenon of an abandoned place makes an interesting connection to the physical characteristics of the place. Because there is often a place by itself– there are roads, there are buildings, but there are no people. The form is not filled with function and loses its meaning [18]. Land abandonment, in turn, is a process in which people no longer have control over land, it is transferred to nature and, depending on climatic and ecological conditions, land may be considered to be abandoned after a certain time [21].

If we consider the landscape as variable but constantly existing, then abandonment is the variable value that can be present in a landscape (it's part or its elements) at a certain point in time. What has now been abandoned has been formed as a result of different process interactions and can be used again in the future or entirely disappear. Considering that the elements to be included in the definition of an abandoned landscape are function, human activity, and social aspect, it is necessary to create a link for abandoned places and objects and the concepts of the cultural landscape. Art scientist Spārītis considers the successful definition of the cultural landscape as "due to biotic and abiotic factors human-made landscape, reflecting the degree of material development with changes raised of social and cultural evolution" [44]. The cultural landscape is based on the geological, geographical environment, flora and fauna, while it is transformed by social factors, thus nature and human interaction

TABLE 2

Definitions of abandoned agricultural land types
[developed by the author by using Yang et al. 2000]

Type of abandoned agricultural land	Definition	Non-management period	Vegetation
Wholly abandoned agricultural land	Completely non-existent management of agricultural land and the natural return of vegetation to the forest or lawn ecosystem	2 years or more	Mostly weeds, some shrubs
Partly abandoned agricultural land	Agricultural land with low management intensity and is not completely abandoned; economic benefits are low or there are none at all, but other forms of income may be supported	1 year	Specific weeds
Agricultural land abandoned in a transition period	Types of land usage which are modified or returned from agricultural land	1 year or more	Specific weeds, shrubs

[44]. There is observed a decrease in human interaction or a lack of presence in abandoned landscapes. The presence of people in the landscape is usually divided into two large groups, the local population, and visitors of the area. Four types of areas are divided on assessing the number of population and visitors:

- a large number of population and visitors to the area – such area is defined as diverse and with direction towards sustainability by the interaction of internal and external desires;
- a large number of populations, but a small number of visitors to the area – such area is considered to be a potential conflict area, which is often defined as the living environment of a closed society;
- a small number of populations, but a large number of visitors to the area – it is also seen as a potential conflict area where is the tendency to polarize imposed external desires;
- a small number of population and visitors to the area – development towards recession, typical to areas abandoned for a variety of reasons [44].

In the context of this approach, an abandoned landscape is considered to be an area in which both the population and visitors are reduced [44]. Abandonment in the rural landscape is characterized by the unavailability of infrastructure and services [19]. Abandoned agricultural lands are subject to a wider timescale so that they could be defined as abandoned. Based on the definition provided by the European Environment Policy Institute and its extension, three sections are formed: wholly abandoned agricultural land is agricultural land that has not been processed or cultivated for at least for two years; partly abandoned agricultural land is the one which has not been managed for one year; abandoned agricultural land which is in the transition period is the return of agricultural land on forest land (Table 2) [50].

The definition of partly abandoned places and objects coincide with the clarification of degraded areas, but these concepts are not considered to be synonyms [1; 2; 12]. Abandoned places and objects may also be degraded, but there should not be a sign of equality between them. On summarizing many different visions and definitions, Sandra Alker and her colleagues provide a summary of the criteria for degraded areas. Degraded areas are land or buildings which are not currently in use, but have previously been developed and are located in both the countryside and urban areas. Degraded areas maybe, but not necessarily are – partly populated/used areas, legally contaminated areas, green belts, soil-contaminated areas, as well as empty and abandoned areas [2].

The perception of planning processes by concerned parties involved in planning is often more important than reality [7]. Human vision is selective and, which is not even less important – the human brain interprets what has been seen, so the visual perception of the landscape is not objective. People give their value to what they have seen, evaluating through a subjective prism. People value the landscape differently and see different shapes and elements in it. Controversial perception also means that what seems beautiful to one person might seem ugly for another [9]. People mostly have an emotional view of the landscape, a desire to highlight natural aesthetic and human-made values [44]. Landscapes that are considered to be abandoned, and do not have content are similarly important for social places and landscape building as those which are celebrated, restated and mentioned.

Architectural and urban planning industries are mainly working on filling empty places, transforming the uninhabited area into a populated, unproductive area to functional, empty area in built-up. These days, the positive vision of the concept of emptiness, as it has not been before, appears.

The new vision includes a view on emptiness or abandoned, places as freedom and opportunity. The positivity often stems from the presence of a temporary factor [39]. In the social aspect abandoned landscapes are perceived negatively [8; 11; 42]. Several studies show that abandoned agricultural lands and farms are perceived negatively from both the local population and the tourist perspectives [10]. Issues of planning abandoned places and objects are important because they have negative psychological and economic impacts. Residents perceive regretfully abandoned landscapes that are located around village areas. Visitors of the area also perceive regretfully the loss of cultural values in the rural landscape, while at the same time seeing the positive in wilderness distribution [34]. Marginal areas not only lose attractiveness in people's eyes but also contribute to the crisis of place identity in the rural population [36].

Abandoned objects, buildings in the landscape can be perceived differently. Historical elements such as ruins (in the period of Renaissance or neo-classicism) are associated with space creation, searching for proportions, and have often been recreated with modern materials. There are differently perceived industrial buildings and areas that are evidence of shortcomings or failures, fate, and resource exhaustion. It is possible that in different cultures concepts are not perceived in so different ways, but it should be noted, in principle, that in the context of history we are generally talking about ruins, whereas in the modern context (industrial heritage) we are talking about abandonment [13]. Industrial heritage is diverse, it can strengthen the recognizability and identity of the place, but it can also be as dangerous, abandoned, and contaminated areas [12].

The rural landscape in general, from the point of view of stereotypical place perception, includes emptiness and abandonment in such a way that it is free from disturbing aspects, such as noise and dense infrastructure. In 1995 Rural Defence Council of the UnitedKingdom / England offered, as an approach to the characterization of rural areas – countryside, indicators such as the level of silence, the level of sky darkness at night, the sense of isolation and naturality, the number of abandoned lands and buildings, the sense of the community, the level of available services, the number of available skills, the attractiveness of the landscape, the frequency and accessibility of public transport. These and other indicators may be applied to the identification of rural areas, as well as to point out the existing idea of the countrysides [14].

Conclusion

Although there are regional differences, there are similar changes in rural landscape planning in Europe as a whole. Further research should develop much deeper detail into regional rural landscape development processes, including – interactions, shapes, processes. Planning in landscape-scale nowadays can be seen as the most sustainable way of planning. The initial planning goals - the creation of a quality living environment and job creation - are still relevant in rural landscape planning. Although the landscape planning approach started as part of regional and strategic planning, today the importance of the landscape planning approach at the local level is emphasized, including spatial interactions, objects, processes that can be both visible and invisible. Rural landscape development and change processes for the last decades in Europe are closely linked to the Common Agricultural Policy. After researching the scientific literature, the definition to be put forward - an abandoned place/object in the context of planning, can be considered as one year or more not used according to the defined function, or a place/object as abandoned, defined in human perception. When including the concept of abandonment, planning must consider its variability over time and the perception of the population as well as tourists. Experience to date in research covers both the use of digital technologies and the inclusion of surveys. The use of digital technologies is necessary to make detection and survey more efficient, while surveys are needed to study the perception of the population, as well as to include the opinion of the population in the planning processes. For abandoned sites and objects, the issue of perception is important in their planning and management, as well as the vision that such sites should be assessed not only negatively but also positively. Although abandonment has both negative and positive effects, it has to be resolved mainly because, in the view of the local population, these places and objects are to be assessed negatively.

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Kopsavilkums. Pētījums sniedz ieskatu pamesto vietu un objektu definīcijā lauku ainavu plānošanā. Pētījuma mērķis ir apzināt būtiskos lauku ainavu plānošanas aspektus, kas saistīti ar pamestām vietām un objektiem. Nozīmīgi ir izmantot šīs literatūras apskatā iegūtās atziņas turpmākajos pētījumos, kas jau definē pamestas vietas un objektus un sniedz vadlīnijas šāda veida vietu iekļaušanai plānošanas dokumentos. Lauku ainavu plānošana tiek uzskatīta par plānošanas nozares attīstības sākumu, taču plānošanas jautājumi šajās dienās ir virzījušies lielpilsētu virzienā. Lauku ainavu plānošanā joprojām ir aktuāli sākotnējie plānošanas mērķi – kvalitatīvas dzīves vides veidošana un darba vietu radīšana. Mūsdienās tiek uzsvērta ainavu plānošanas pieejas nozīme vietējā līmenī. Lauku ainavu attīstības un pārmaiņu procesi ir cieši saistīti ar Kopējo lauksaimniecības politiku. Par pamestu vietu/objektu plānošanas kontekstā var uzskatīt tādu, kas netiek izmantots vienu gadu vai ilgāk atbilstoši noteiktajai funkcijai, vai vieta/objekts kā pamests tiek definēts cilvēka uztverē.

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Blended learning in lifelong adult education in the aspects of covid-19 epidemical restriction

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Abstract. Digital skills are one of the most important skills that were highlighted in the times of COVID-19, including areas like landscape architecture. COVID-19 pandemic raised possibilities for blended-learning in adult education that were not used much before the pandemic. Data shows that Latvia's inhabitants digital skills compared to the EU average is much lower and there is a need for innovative ways to attract lifelong learners to participate in skills' advancement courses. At the end of 2020, a survey was conducted with the aim of the survey to find out the society's self-assessment of digital skills and the need to improve them for remote working. Results showed that a high number of respondents are willing to participate in blended learning courses and are eager to develop their digital skills.

Keywords: blended learning, digital skills, human capital, COVID-19, landscape architecture

Introduction

The World Economic Forum in a statement said that by 2025, about half of the workforce would need to retrain [17]. It is noted there that most of the professions of the future do not currently exist (65 % – 2030) and a large part of the current professions will be automated (47 % – 2030). In order to realize the set goal, the people of Latvia will need to improve or acquire digital skills. For many professions digital skills emphasized as compulsory skill. For example, Landscape architects must have the ability *to use information technologies* [10] (Regulations on the Classifier of Professions, basic tasks corresponding to the profession and basic qualification requirements). It is the same for almost every profession. That is why it is important to make effort on national level.

One of the ways to implement it is to organize courses for the unemployed and professional development. National employment services have become co-responsible not only for providing social support mechanisms, but also for developing the necessary skills of the workforce.

COVID-19 pandemic brought large changes in society and had a high impact on education. James & Thériault (2020) [8] in their research on COVID - 19 impact on adult education writes that pandemic lightened out inequalities that had a high impact on access and participation of learners in lifelong learning. On the other hand, Latvia's case showed that pandemic opened new possibilities for adult learners to participate in lifelong learning. There was very high activity from people to participate in lifelong learning courses co-financed by the state. If to compare - in 2017 there were 5565 people willing to participate in courses, but in 2020 there were 19 893 people (see Figure1, data from https://www.macibaspieaugusajiem.lv/). In addition, if in 2017 there were most of the courses face-to-face then in 2020 all courses offered online or in blended mode because of COVID-19.

In 2019, 7.4 % of the population aged 25–64 in Latvia were involved in lifelong learning, compared to 20.2 % in Estonia and 7 % in Lithuania. Latvia ranks 18th in the EU according to this indicator (EUROSTAT, 2016).

The aim of the research was to find out reasons and possible solutions for learners to motivate their participation in lifelong learning and to analyse blended-learning possibilities in COVID-19 restrictions.

COVID-19 blended-learning in adult education

Blended learning is defined as planned, pedagogically meaningful integration of face-to-face and e-learning [12]. Blended learning not only enriches the learning process but it gives possibilities for learners for more active participation in the learning process [5]. Blended learning gives new learning experience for learners as well as new teaching experience for teachers [13]. Meaningful integration of e-learning tools gives opportunity for learners for personal development, as well as to develop such cognitive skills as critical thinking and conversation leading [5; 15]. Blended learning experience enriches learners' learning as well as teachers' teaching praxis.

COVID-19 brought a new meaning of blended-learning where offline learning is blended with online learning (not face-to-face with e-learning). There is a lot of difference if every online learning happens using videoconference tools as a replacement for face-to-face sessions. Many

Fig. 1. Number of participants in the state co-financed lifelong learning courses in Latvia [created by authors]

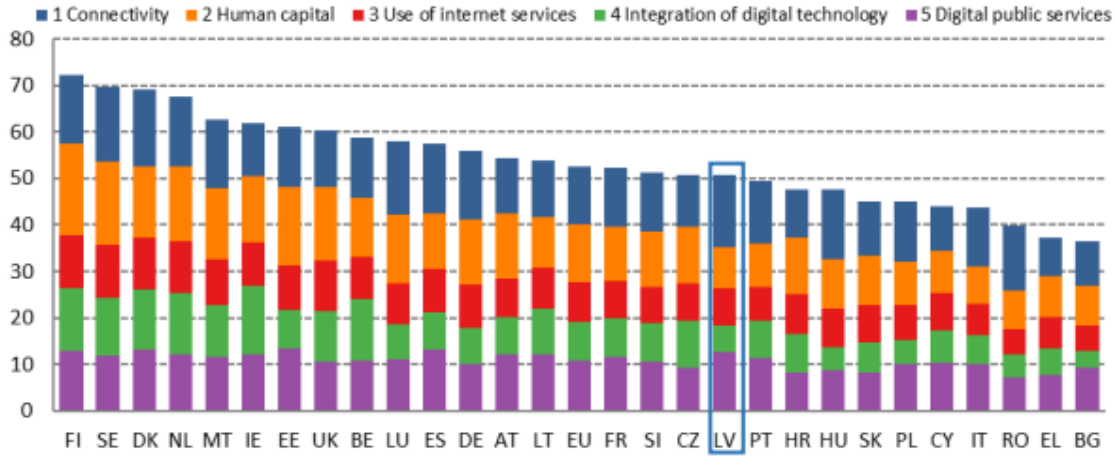

Fig. 2. Digital Economy and Society Index, 2020 [DESI 2020, European Commission]

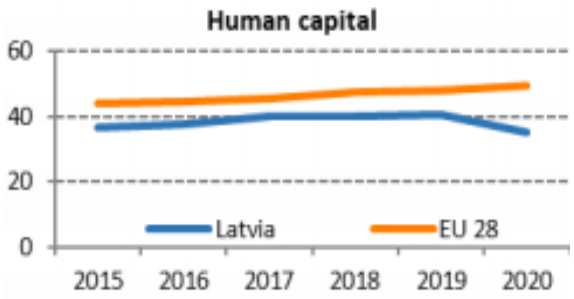

Fig. 3. Comparison of human capital Latvia and EU average, 2020 [created by authors]

teachers do not know what is "blended learning" [1] that makes the learning process ineffective. If face-to-face settings allows learners to make relationships with other learners and teachers that is seen as a vital part of learning [8], then the pandemic situation's solution - online video conference - cannot replace it. Teachers are experiencing disorientation, questioning previously held assumptions and seeking adequate pedagogical responses to meet new learning needs [4] in lifelong learning. Teachers need to develop their teaching skills to adapt and work in new adult education types. For a lot of teachers who participated in lifelong learning teaching in online mode (using ZOOM, MsTeams or other video conference tools) started as "talking heads".

COVID-19 also highlighted issues related to digital skills. The poor digital competence can lead to unsuccessful blended learning/ online learning experience as well as impact outcomes of the learning. To use technological tools effectively learners and teachers have to know them and have to know how they work [6; 3; 16; 17]. Usage of different technological tools depends on users' skills and historical body [14] – it means that users use technological tools as they used to use. So, as a more advanced IT user learner is, it is easier for them to use it for learning (in this case, for blended and online learning), because learners can pay their attention more on the content not on the technology itself [11]. However, pandemic pushes develop not only digital skills of learners but teachers as well.

Digital skills of learners

The digital skills of European citizens needed for further education assessed using the Digital Economy and Society Index (DESI) [2]. DESI is a composite index published every year by the European Commission since 2014 and tracks the progress of EU countries in their digital competitiveness. The DESI is composed of five principal policy areas, which regroup 34 indicators overall. Five principal policy areas are as follows:

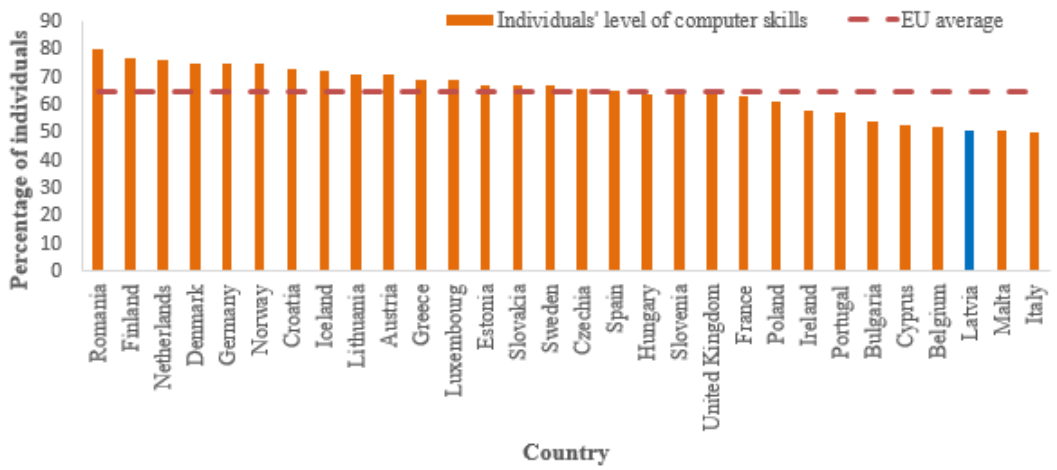

Fig. 4. Comparison of Human Capital with all 28 EU countries, 2020 [created by authors]

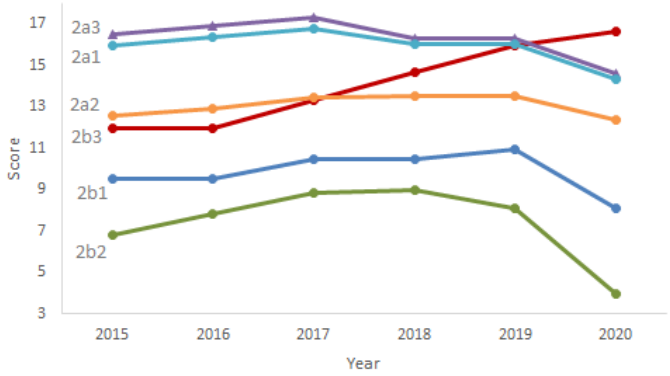

Fig. 5. Latvia's indicators of the Human Capital sub-dimension [created by authors]

1. Connectivity;
2. Human capital;
3. Use of internet;
4. Integration of digital technology;
5. Digital public services [2].

Comparing 28 EU countries according to the DESI index, Latvia ranks 18th-19th in the period from 2014 to 2018. In 2019, the DESI calculation methodology was slightly changed, but the result remained unchanged both in this year and in 2020, Latvia is still in the 18th place (see Figure 2).

In some principal policy areas, like Connectivity, Latvia ranks one of the leading places in the EU (4th place). The main problem in Latvia is a poorly developed Human capital area (24th place), which consists of two equally important sub-dimensions (Internet User Skills and Advanced Skills and Development) and six individual indicators of sub-dimensions.

Internet user skills includes at least Basic Digital Skills, Above basic digital skills, At least basic software skills, but Advanced Skills and Development includes ICT (Information and Computing Technology) Specialists, Female ICT specialists and ICT graduates.

Comparing these four groups between Latvia and the EU average, it is Human capital that has been the biggest problem for a long time and this sub-dimension has been continuing to decline since 2017 (see Figure 3).

Latvia compared with the other EU countries by 2020, shows that it holds one of the lowest positions and the gap continues to grow (see Figure 4).

Looking in more detail at the Latvia' individual indicators of the sub-dimension Human Capital:

2a Internet User Skills: 2a1 At least basic digital skills; 2a2 Above basic digital skills;

2a3 At least basic software skills;

2b Advanced Skills and Development: 2b1 ICT Specialists; 2b2 Female ICT specialists;

2b3 ICT graduates.

The figure 5 shows a significant increase in only 2b3 ICT graduates (increase – 0,7 scores) but other indicators are declining.

According to the trends shown in the figure 5, Latvia should pay special attention to the development of Above basic digital skills (2a2, decrease – 1.2 scores). At least basic digital skills (2a1, decrease – 1.7 scores), At least basic software skills (2a3, decrease – 1.7 scores), ICT Specialists (2b1. decrease – 2.9 scores). Female ICT specialists (2b2, decrease – 4.1 scores), that can be achieved, firstly, by organizing lifelong learning courses as well as possible, and secondly, involving as many people as possible. Analysing data from lifelong learning participants who

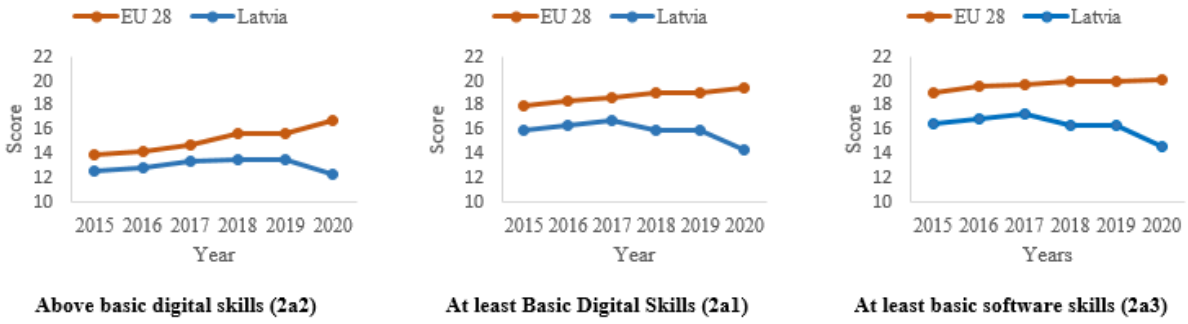

Fig. 6. Internet User Skills (2a) [data from European Commission, Digital Scoreboard, 2020]

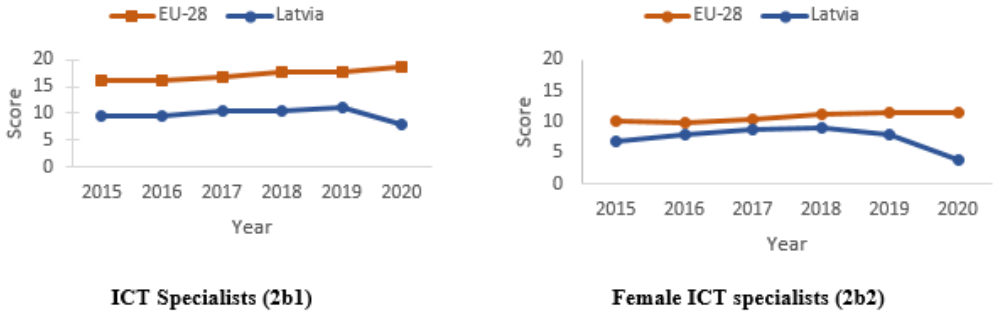

Fig. 7. Advanced Skills and Development (2b)
[data from European Commission, Digital Scoreboard, 2020]

participate in the state co-financed courses, around 40 % of learners participate in courses related to digital skills (information from the Ministry of Education and Science of Latvia, 2021).

Comparing the average Internet User Skills (2a) on Above basic digital skills and At least basic software skills field of Latvia and the EU in detail, it shows that Latvia lags behind in all positions (see Figure 6).

The most decreased is Above basic digital skills (2a2) compared to EU level decrease in 2019 is 2.21 scores but 2020 is 4.48 scores. At least basic digital skills (2a1) compared to EU level in 2019 difference is 3.04 scores but 2020 is 5.12 scores. The same situation is about At least basic software skills (2a3) field where compared to EU level difference in 2019 is 3.7 scores but 2020 is 5.56 scores. Those are the most important topics that lifelong learning' system can react more quickly and need to do proactive steps, for example, offer wide range of courses, prepare MOOCs (Massive Open Online Courses), collaborate with IT companies and educational institutions in the field of IT.

ICT Specialists' (2b1) situation compared to EU level shows that differences in scores are – in 2019 are 6.67 scores but in 2020 are 10.48 scores. Female ICT specialists (2b2) scores are in 2019 scores are 3.44 but 2020 is 7.57 that pushes Latvia's lifelong learning institutions as well as other informal educational institutions to react more quickly, for example, there is initiative in Latvia TechGirls that tries to correspond this issue and organize free of charge IT courses for women. However, such initiatives must come also from lifelong learning institutions as the main players in the professional development field (see Figure 7). Some educational institutions make effort on development of digital skills. For example, Ogres tehnikums provides an opportunity to acquire digital skills in four professional development education programs in 2021 - "Landscape Architecture, Spatial Planning", "Garden Landscape Planning", "Video Development - Basics of Filming and Editing" and "Working with InDesign CC in the field of printing and media technologies" in the framework of European Union funds project no. 8.4.1.0/16/I/001 Implementation of the 6th round "Improvement of Professional Competence of Employed Persons".

Results and Discussion

According to statistical data analysis, research questionnaire was conducted.

In order to establish a lifelong learning course contribution to tackling the problem the survey has been conducted. The aim of the survey was to find out the society's self-assessment of digital skills and the need to improve them for remote working. The main motivators for further supplementing knowledge and skills in lifelong learning courses were also identified.

The survey was conducted in November and December 2020, distributing it electronically. Respondents were mainly those who attended some lifelong learning courses in Riga remotely, but also from regional universities.

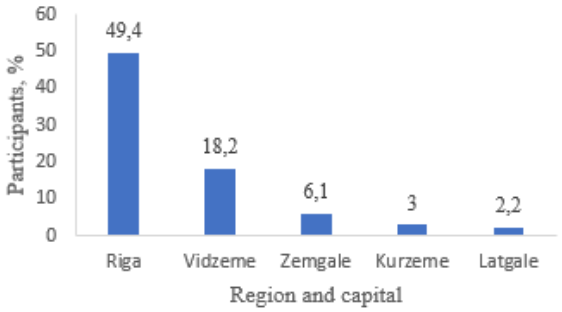

Fig. 8. Respondents from Latvia's regions [created by authors]

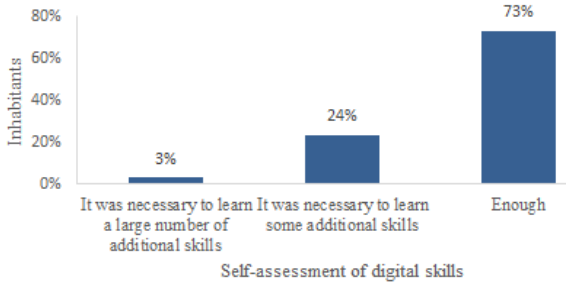

Fig. 9. Self-assessment of digital skills in Latvia as a whole [created by authors]

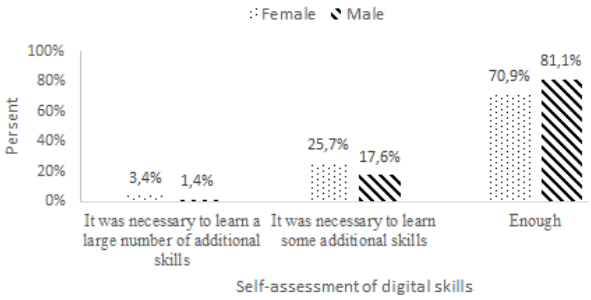

Fig. 10. Self-assessment of digital skills in Latvia by gender [created by authors]

The survey involved 525 respondents, 12 questionnaires were not correctly filled in, and so the analysis was aided by only 503 questionnaires.

Means (M), standard deviation (SD), absolute and relative frequencies were calculated for descriptive statistical analysis. A total number of respondents were 503; aged 24 to 60 were interviewed. The average age of the respondent is 37.8 years (SD = 8.7). In this sample 375 females (74.6 %), with average age 37.7 (SD=8.7) and 121 male (24.1 %), with average age 37.6 (SD=42.7). 6 respondents (1.4%) did not want to indicate their gender (M = 42.7, SD = 6.8). 81.2% of respondents had higher education (BA – 38.6 %, MA - 39.4 %, PhD – 3.2 %). On the question "How do you rate your digital skills in the time of remote working?", respondents gave a self-assessment of their digital skills. 415 participants assessed their skills. 303 respondents (73.0 %) acknowledged that their digital skills were sufficient, 100 employees (24.1 %) needed to acquire some additional skills, but only

TABLE 1
Advantages and disadvantages of re-attending the courses [created by authors]

Positive aspects	1. New knowledge - changes the point of view, broadens the horizons 2. Opportunity to improve oneself both professionally (increase skills and abilities) and personally (for self-growth, also hobbies) 3. Desire to develop 4. I like to study 5. Increasing competitiveness in the labour market 6. Useful for work 7. Good content 8. Good performance (motivated, professional teachers) 9. Payment (State aid) 10. Opportunity to learn remotely 11. Willingness to change occupation 12. Content - teaches what you really need 13. Possibility to combine with work 14. Remotely - wider choice for those livingoutside Riga
Negative aspects	1. Dissatisfaction with existing courses 2. Did not live up the expectations 3. Too wide course topics 4. Too high course intensity 5. I don't like that courses take place online 6. Insufficient supply (topic) 7. It is difficult to combine children and distance learning in the evenings 8. Large number of hours (160h) 9. Too much time is spent learning a substance that they can learn on their own.

12 respondents (2.9%) needed to acquire a large number of additional skills. This self-assessment of digital skills differs from that seen in EU statistics (see Figure 5). In general, the self-assessment of digital skills in Latvia is high, 73 %. Only about 3 % of respondents agree that digital skills need to be significantly improved.

To the question, "Would you take professional development courses again?" 358 respondents answered. 256 respondents (71.5 %) are convinced that they will repeatedly be involved in professional development courses. 88 respondents (24.6 %) are partially sure that they will participate, 8 (2.2 %) have not decided and 6 (1.7 %) have answered with no. Rather convincing or convincing in Zemgale, Latgale and Kurzeme – 100 %, Riga – 96 %, Vidzeme – 95 %. The main advantages and disadvantages of re-attending the courses are shown in Table.

Conclusions

Research showed that several indicators of digital skills describe Latvia's situation as critical (in EU context), around 40% of inhabitants between years 2017 and 2020 were willing to develop their digital skills by participating in the state co-financed lifelong learning courses. Reasons not to participate

can be different - lack of information, lack of time, problems of combining family, work and learning, bad experience in courses.

Research showed that even learners are willing to participate in lifelong adult education; there are negative aspects they see, especially in the frame of remote learning. Learners see an opportunity to learn remotely as positive and as a negative aspect at the same time. Future research must be done on reasons that brought negative experiences to learners. One suggestion is that there is a need to teach adult education teachers on remote learning methodology and develop their digital skills to make learning more meaningful and goal-oriented.

Particular attention should be paid to innovative methods of engagement to increase the number of people attending lifelong learning courses, for example:

- to create a more flexible educational offer that meets the needs and opportunities of adults;
- note a lower minimum number of learners to start group training;
- tax incentives for companies and individuals;
- grant for companies and individuals;
- training leave;
- organize courses with the state co-financing.

One more suggestion is to use the advantage of blended learning as remote learning increases people's involvement in courses, but some also want online meetings. Involvement in lifelong learning courses in the national education strategy should be a priority, because according to the data shown above; Latvia is rapidly lagging behind the EU average and, starting from 2017, is reducing its performance.

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