

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



Valerii Tovbych, Kateryna Herych, Nataliia Vatamaniuk

Kyiv National University of Construction and Architecture, Ukraine

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 Mollison, 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 permaculture;
- 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 interfluvium; 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 interfluvium (Fig. 2) is divided into seven natural areas:

Zastavniivsky 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 Zastavniivsky 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 interfluvium (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 Zastavniivsky 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, Dolyniany, 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

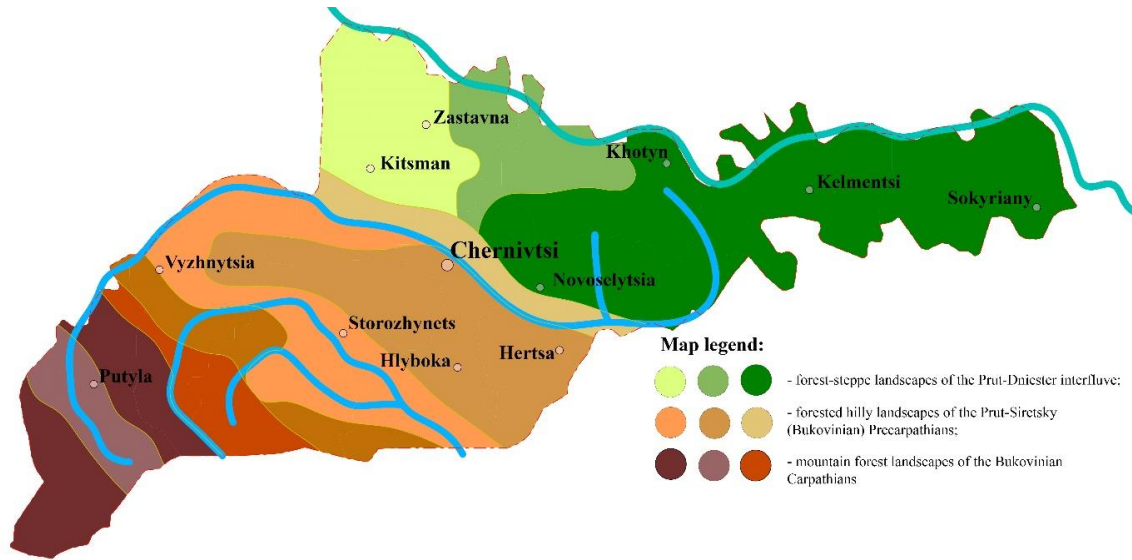


Fig. 1. Map of landscape features of Chernivtsi region [from authors private archive]



Fig. 2. Prut-Dniester interfluvium (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.

Hertsaiivsky 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.

Mizhsiretsky 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 Beregomiet 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-Kobyly), which generally correspond to the Montenegrin tectonic zone. It is suitable mainly for tourist recreation.

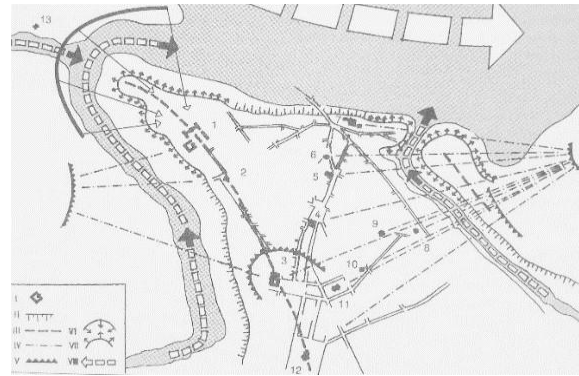
Yarovytsia forest-mountainous middle mountains – the highest area of the Bukovinian Carpathians, which consists of two mountain ranges: Yarovytsia with a height of 1574 m and Tomnatyk – 1565 m.

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

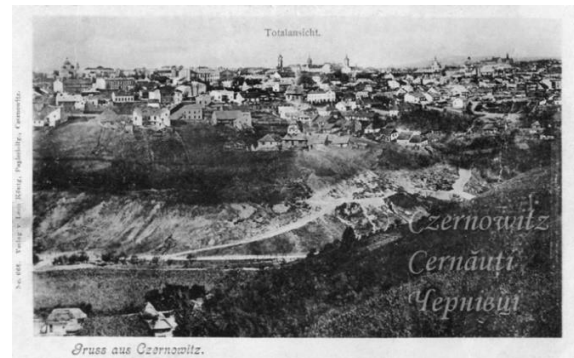
It is also possible to consider separately the territory for the development of the city of Chernivtsi: functional zoning, the formation of the planning structure and urban composition. The natural component is one of the most stable and formative factors in the development of the city. Terrain, hydrography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

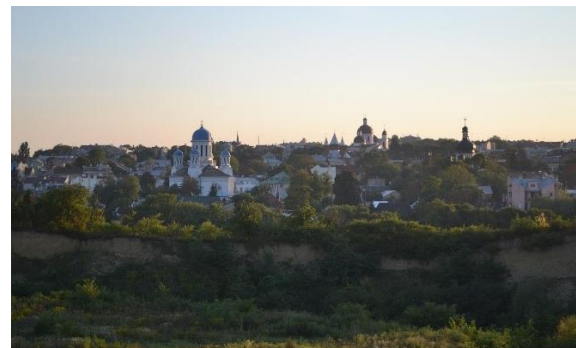
The ridge and the valley have longitudinal axes, the valley with its shape (slopes and bottom) connects the space, and the ridge divides it. The hill and the hollow (conditionally hemispheres) have vertical vector axes, but also differ in spatial and visual properties: the hill divides, and the hollow



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



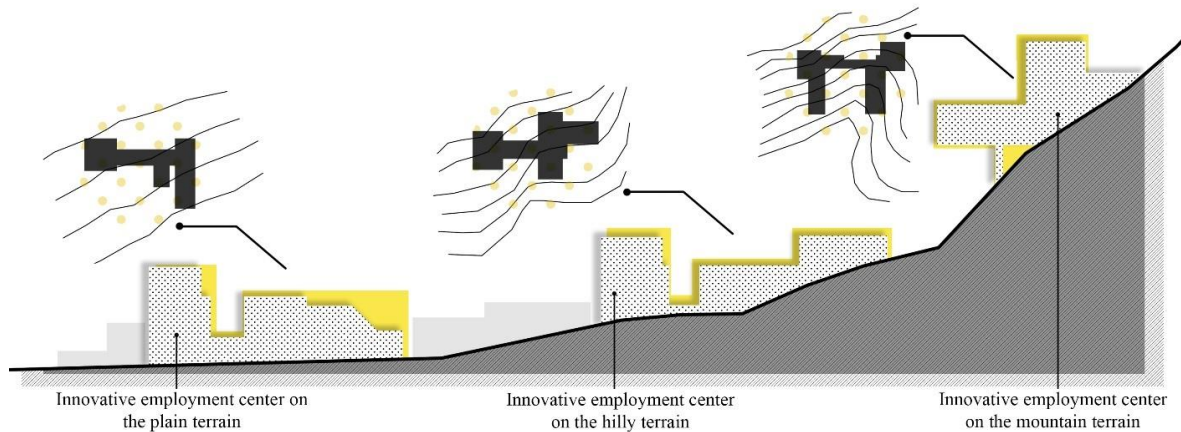
*Fig. 6. Historical photo.
View of the city of Chernivtsi from the Weinberg
[from authors private archive]*



*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 interfluvium), 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

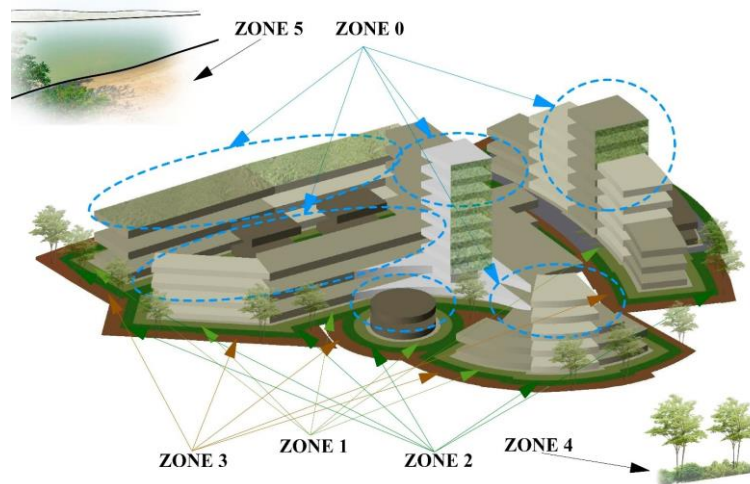


Fig. 9. Application of the permaculture method of zones for landscaping of the territory of the innovation employment center [from authors private archive]

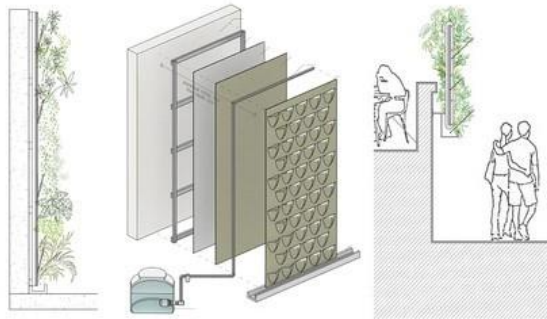


Fig. 10. Example planting facade. Source: Muro Verde / Jardin Vertical [from authors private archive]

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 be aesthetically 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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AUTHORS:

Valerii Tovbych, Doctor of science (Architecture), Professor, sphere of activity – landscape architecture, theory of architecture, innovation technologies in architecture, Kyiv National University of Construction and Architecture, 31, Povitroflotskyi Avenue, Kyiv, Ukraine. E-mail: tovbych@gmail.com

The study was conducted by post-graduate students of Yuriy Fedkovych Chernivtsi National University on local material and their own experimental research in accordance with the current at the Kyiv National University of Construction and Architecture state research work of the Department of Information Technology in Architecture and Science School “The modeling and forecasting of the processes and the phenomena in architecture” (supervisor – Doctor of Architecture, Professor Valerii Tovbych).

Kateryna Herych, Post-graduate student, Kyiv National University of Construction and Architecture, 31, Povitroflotskyi Avenue, Kyiv, Ukraine. E-mail: katia2847@gmail.com

Nataliia Vatamaniuk, Post-graduate student, Kyiv National University of Construction and Architecture, 31, Povitroflotskyi Avenue, Kyiv, Ukraine. E-mail: nata.vata12@gmail.com

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.