

# The Definition of Principles of Architectural and Landscape Layout of River Valley Spaces in Mountain Region (as based on the example of Ukrainian Carpathians)

## Abstract

This research paper is dedicated to important integration of human and nature, which is shown in architecture and landscape design of river valley areas in the Carpathians. The author's goal was to define special features of this integration and to ground principles of architecture and landscape layout in these terrains. The research is based on specialized literature sources, maps and field research projects. To reach the goal the notion of «mountain river valley area» and its structure was considered. The author names ten groups of factors that have impact on architectural and landscape layout of mountain river valley areas. According to these factors the analysis of extant architecture and landscape integration in river valley areas in Carpathians was made, based on which regularities and irregularities of architecture and landscape integration mechanisms in the researched terrains were defined. As a result, five principles of architecture and landscape management and development of river valley areas in the Carpathians were substantiated.

**Keywords:** river valley, architecture, landscape, organization, planning, factor, principle

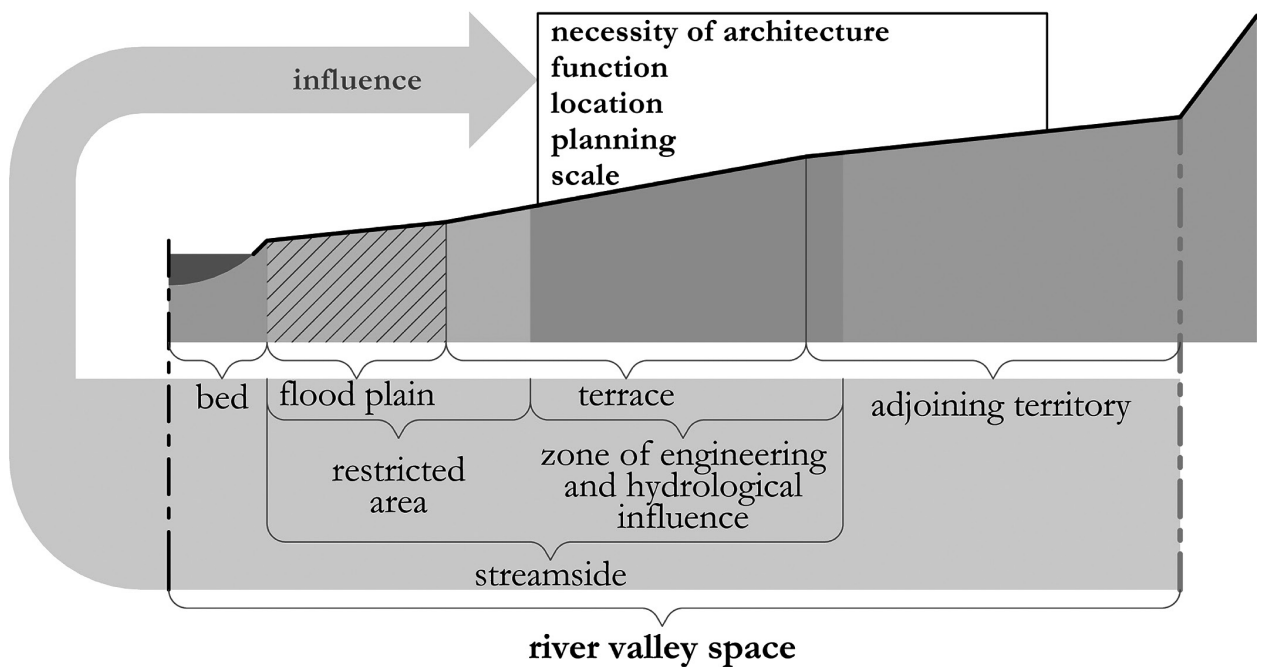
Since the beginning of XXI cent. due to the rapid development of tourism and recreation, change of property forms and way of economic management, the urbanization processes in Carpathians is becoming especially dynamic, the habitation and infrastructure of which are focused mainly within the river valleys. The intense interest to these terrains is caused by its essential resource potential and strategic location. The Economic situation of Ukrainian Carpathian habitations is quite tough, which is reflected in the city-development as well. With the lack of scientifically-grounded approach to the project solutions the urbanization process may affect the natural balance, lead to the disproportion in socio-economic and ecological development. There is a threat of loss of unique landscapes, views and interesting material architectural values. Ill-conceived economic management in Carpathians leads to the increase of destruction processes, catastrophic floods and high water. The protection of valleys and their inhabitants against the destructive influence of natural disasters becomes quite an actual issue.

The research objective is to determine the peculiarities between the interaction of architecture and landscape in the river valleys of Ukrainian Carpathians and substantiation of methodological

basis of architectural and landscape organization and development of these terrains.

The issue of correlation between the human being and nature is quite actual today both in its global sense and for mountain regions. Architectural and landscape organization of terrains is the sphere where the correlations between the nature and anthropological activity are most visible. The river has always played a critical role in human life and activity, in mountainous regions it is a water resource for everyday needs, the means of energy production and esthetic finery. The experience of projecting in the mountainous regions shows the extensive use of valleys and existence of different approaches in architectural-landscape and city-planning solutions of functional and esthetic organization of these territories in general and coastal zones in particular.

In the process of research the natural river valley structure was considered along with the peculiarities of its mountain origin. This paper



il.1. Structurally-logical model of interaction between the architecture and landscape in the mountain river valley (made by author)

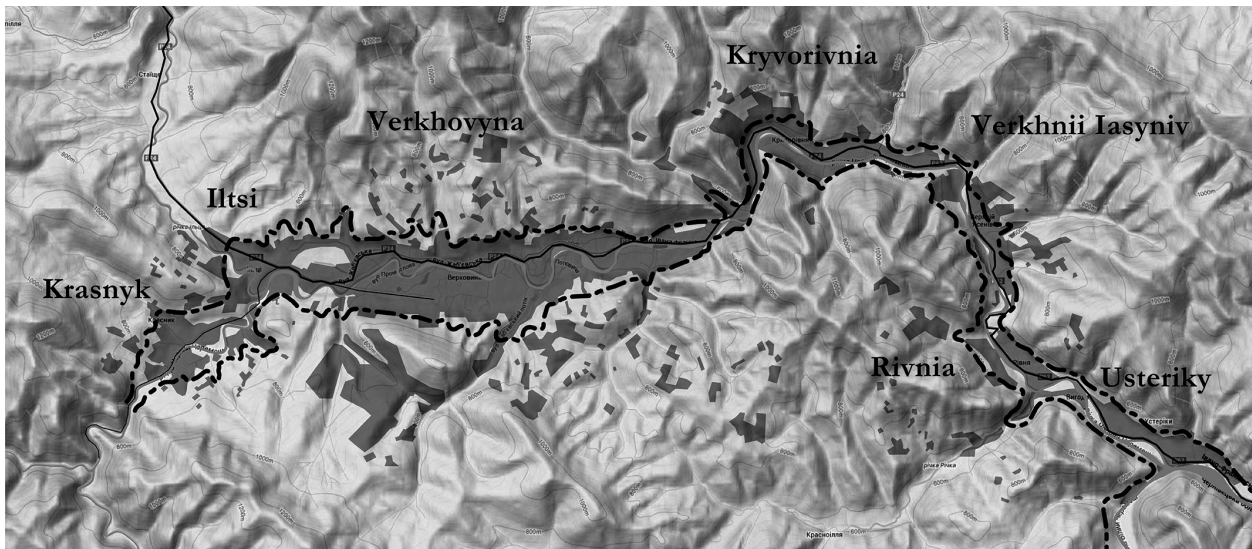
determines river valley terrain as something wider than river valley. According to the author, the mountain river valley terrain, as an object of city-planning is the environment with characteristic natural and landscape conditions, horizontal limits of which are determined by the natural river valley with regard to the city-planning and normative criteria. It means that when determining the width of valley terrain the relief is the key factor, though, the buffer zone and architectural and space-planning territory design are also taken into account. The specificity of architectural and landscape interactions in mountain river valley space is reflected in the structurally-logical model (il. 1).

The mountain river valleys are not homogeneous lengthwise. Therefore, Ukrainian Carpathian river valleys are generally classified with regard to the following conditions: 1) hard to access, narrow or medium in their width, unexplored – located mainly in the highlands, in the upper rivers, unsuitable for exploration due to the natural and landscape conditions; 2) easy-to-access, underexplored, medium or wide – suitable for exploration valleys, underexplored due to natural, historical conditions and access quality with a sufficient number of natural territories; 3) accessible, well-explored, medium or wide – suitable and well-explored valleys with a sufficient area occupied by the settlements, mainly located lower than 600m above the sea-level.

As to the Ukrainian Carpathians, this is the region of Ukraine, distinguished from the others due to its natural conditions, though, it has other characteristic peculiarities. The analysis of conditions in Ukrainian Carpathians demonstrates the especial challenge caused by the problem of regulation of the relations between the landscape and architecture in this region due to the specific natural conditions and threatening anthropogenic situation. In the history of Ukraine the river valleys served for communication through the mountains, along which the residents' life was developing, social and political contacts were established, settlements were

emerging most of which exist today. The river valleys are the places of concentration of residential complexes, farming, everyday and cultural activity in the mountains. They determine the configuration of regional network of settlements, influence the size of settlements, and farming. Their specific natural condition and potential are the key factors of both physical and spiritual formation of Carpathians social environment. In combination with east-Slavonic and all-Ukrainian traditions and state laws they caused the appearance of special types of activity and forms of settlements, identical architecture, everyday life, culture characteristic of the Carpathian territory of Ukraine. Like all Carpathians, the researched territories have an essential developmental resource potential, though, they are a dynamic space which is mostly put at risk with regard to the people's safety and ecologically-economic losses caused by the natural disasters.

On the basis of previous research, ten groups of factors influencing the architectural and landscape organization of the river valleys were determined: *city-planning location, natural and landscape conditions, ecological situation, historical conditions, urbanistic and planning conditions, functional characteristics, compositional and esthetic characteristics, social conditions, economic situation, normative and legal factors*. They are a ground for further research in characterizing and analysis of architectural and landscape interrelations within the valleys of the region. Natural and landscape factors have the



il. 2. Analyzed local system of settlements in the valley of the Black Cheremosh river with signed river valley borders (made by author)

most intensive impact which demonstrates the essential interaction between the architectural environment and landscape on the researched terrains. Three factors of architectural spatial organization are singled out: city-planning, functional organization and compositionally-esthetic solution. It was established that their interaction with landscape is mostly reflected in the peculiarities of *environmental friendliness, aesthetic qualities and ergonomicity*, which attracts special attention to them while analyzing certain terrains.

The authorial research of architectural and landscape interactions of the river valleys on three different levels was conducted: macro-levels – territories of the local settlement systems in the river valleys, meso-levels – settlements, microlevels – architectural landscape elements (il. 3). On micro-level the fragments of the two local settlement systems in the popular river valleys of Ukrainian Carpathians – r. Prut, and r. Black Cheremosh were researched. They were categorized, analyzed and assessed with regard to the architectural and landscape interactions. At mezzo-level, five settlements were researched in the river valleys of Prut and Black Cheremosh (il. 2). The characteristics

and analysis were conducted according to the determined factors of influence upon the organization of researched terrain. Special attention was paid to the analysis according to the three distinguished factors of architectural terrain organization. Analysis of architectural and landscape interrelation in the settlements of river valleys indicates that the similarity in the planning, functional, and compositionally-esthetic organization is mainly caused by the natural and landscape peculiarities. Modern condition of architectural and landscape organization is characterized by some «underdevelopment» with regard to modern lifestyle. Peculiarity of natural environment dominating where the traditional architecture of Carpathian river valleys is integrated is most visible in the aesthetic aspect. The landscape esthetics is mostly visible in the combination of its separate elements. Therefore, the third research level is aimed at

il. 3. Characteristic element of architectural landscape: Hutsulshchyna camping site, Yaremche town (made by author using the photo of B. Mindel "Sceneries of Ukraine. Carpathians" complete set of postal cards. The photo is available at <http://uk.wikipedia.org>)



**Planning and Functional Characteristics**

The object is situated on the opposite site of the river from the main road in the tourist and recreation zone. The convenient footbridge connects the object with the main road zone. Transport bridge is situated on some distance from the object.

Architecture of the building keeps the traditional hutsul's motif, the form and scale is good connected with the mountain natural environment. Wooden and stone materials combine with the landscape organic.

developing mainly the aesthetic component. Certain historical and modern object samples were analyzed, as well as the elements of architectural landscape of river valleys in Ukrainian Carpathians. They are characterized by the domination of separate functions, special esthetic qualities, technical performance means and landscape planning.

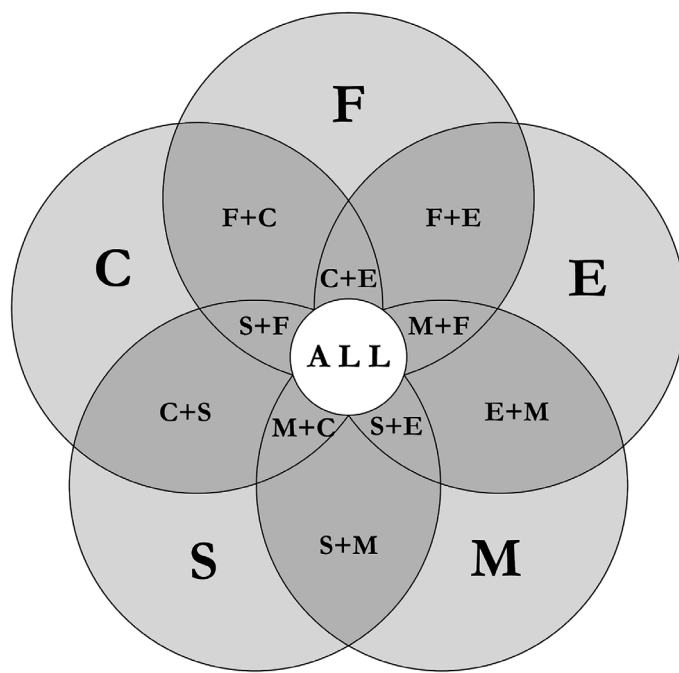
As a result of synthesis of the research findings of architectural and landscape organization of Ukrainian Carpathian river valleys according to certain factors and on different levels the following regularities were found in the planning, functional, and compositionally-aesthetic terrain organization: in the river valleys the chain settlement systems are formed; the settlements are formed in the valleys expansion; geometric form of settlement is usually extended, complies with the configuration of valley terrain; the perspectives of valley development depend upon the efficiency of relations and city-planning location; main communications are concentrated in the valleys; streets and roads which form the skeleton of city-planning space, comply with the relief by their form; The terrain development takes place through the intensification of the valley development; functional structure of Ukrainian Carpathian river valleys is characterized by disorder and chaotic combination of different zones; civil centers are concentrated in the valleys, usually along principal highways; more effects of valley functioning are reached along the valley range system of terrain zoning within the settlements; main compositional axe of Carpathian river explored valleys is represented by the principal transit road; visual perception effects are condi-

tioned by geometrical characteristics of valleys and by the building density; the effects of visual perception are reached by the presence of successful view points of the natural environment and its combination with the architecture; unit-forming spatial elements enrich the environment with the special view points through which the static and dynamic perception of architectural or natural landscape takes place; visual perception of compositional and aesthetic organization of valleys is enriched by accents playing the role of unit-forming spatial elements – bridges of different functions; meaning of decoration materials of the town-planning environment plays an important role in the perception of the aesthetics of combination of architecture and landscape.

The discrepancies between the architectural and landscape organization of Carpathian river valleys were found: difficulties with the creation of alternative communications which very often leads to the oversaturation of the central parts of settlements; the disorder of pedestrian flow and traffic; events of the building location in the close proximity to waterline (conflict between the declarations and practice as to the renaturalization and development of the river-side territories); presence of industrial zones at valuable river-side territories; disbalance in the distribution of main functions in the settlement systems which is reflected in the oversaturation or underdevelopment of tourist sphere of the system; the aggravation of the functional structure and its disorder through the uncontrolled development intensification; difficulties with the arrangement of utility facilities and sewage systems through the uncontrolled intensification of building; discrepancies between the architectural and city-planning solutions and landscape peculiarities; introduction of modern decoration elements of the architectural object surfaces very often leads to the aggravation of esthetic combination of architecture and landscape; introduction of other cultures into the valley architecture leads to the loss of the authentic landscape integrity.

The regularities and discrepancies found demonstrate the essential impact of architectural organization of territories into the ergonomic convenience, ecological safety, economy, and esthetics of the researched terrain.

On the basis of the researches conducted five key principles were determined and grounded, according to which the architectural and landscape organization and development of river valleys should be conducted. *Principle of functional efficiency and sufficiency* is reflected in the determination and distribution of internal and external functions in the system or separate settle-



- F** - principle functional efficiency and sufficiency
- C** - principle architecture-landscape consistency
- E** - principle of ecological friendliness
- S** - principle of safety
- M** - principle of mobility

il. 4. System of principles of architectural and landscape organization of mountain river valleys (made by author)



ment, their distribution and optimization on the basis of analysis of current region condition, its needs and potential. *Principle of architectural and landscape consistency* testifies to the compliance with harmonious aesthetic and functional unity of architecture and natural landscape. *Principle of ecological friendliness* provides for the quality of architectural and landscape organization, which reflects its ability not to affect the environment. This principle is especially important for ecologically-sensible valleys of Carpathian river valleys, where the valuable river-side territories and other natural resources are available. *Principle of safety* of architectural and landscape organization of Carpathian river valleys is necessary to protect the system, its residents, and guests against the anthropogenic disasters characteristic of the researched territories. *Principle of mobility* shall provide for the environment adoption to the regular modifications in the planning and architecture. In architectural and landscape organization of the researched territories it is mainly caused by the dynamism of spatial processes reflected in the spatial tension and the processes of development and degradation of certain functions of systems.

The principles suggested are interconnected (il. 4). Appropriate coordinated implementation of all principles or architectural and

landscape organization of the river valleys will provide for the support of stable Carpathian development at the level of city-planning.

These proved principles make a basis for architectural design concepts in river valley areas to be further developed upon. Proper and comprehensive application of the five principles to the architecture-landscape layout of the river valley areas will ensure realization of sustainable development of the Carpathians on city planning level.

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