
Urban Planning Principles and Methods of Returning Coastal Areas to Citizens

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Abstract: The extremely important issue of today is the return of coastal areas to city dwellers. The peculiarities of urban, landscape and integrated directions of organization of coastal territories are considered with the definition of their advantages and disadvantages. Bright examples of all three principles of coastal development are given. The basic town-planning methods of the organization of coastal territories are defined. The focus is on the urgency of reviving natural ecosystems in cities by revitalizing urban rivers with the return of rivers to their natural qualities - natural bed, flora, fauna, ecotones, which will improve the atmosphere of the urban environment, microclimate, create recreation areas for citizens. The most striking example of successful revitalization project is the revival of the Chongcheong River in Seoul (South Korea). The creation of Pochayna Park in the Obolonskyi district of Kyiv with the revival of the small Pochayna River by Kyiv designers and architects in partnership with Korean colleagues was presented. The creation of public spaces in coastal areas is a condition for improving the quality of life of urban residents. Concern for the human dimension in cities is at the heart of these projects.

Keywords: Public Space, Human Dimension, Coastal Territory, Revitalization, Urban, Landscape, Integrated Principles, Urban Development Methods

1. Introduction

Creating a human-centered urban space where residents will meet their needs for hiking, meeting and socializing over a cup of coffee, easy movement through the streets, comfortable promenade along the coastal areas, quiet observation of city life is perhaps the most important task of architects and urban planners.. Urban space should be comfortable for people, safe, comfortable, lively, environmentally friendly. Unfortunately, modern cities are moving further and further away from these human-centered categories. The rapid development of motor transport is displacing human space in cities, squeezing and squeezing people. Excessive car dominance is obvious and ubiquitous. Motorways are laid directly along coastal areas, which contributes to the degradation of river ecosystems and worsens living conditions in cities. To win back the coastal areas by car and create a public space here is one of the important tasks of designers, urban planners and architects today. Creating comfortable conditions for pedestrians and vacationers near rivers and reservoirs is one of the links for a

lively, safe, environmentally sustainable and healthy life in cities. The considered principles and methods of town-planning organization of coastal territories are directed on the decision of problems on improvement of living conditions of inhabitants near city rivers and reservoirs, return of public space to coastal territories, preservation of ecological balance to river ecosystems.

An important component of comfortable living conditions in cities is the harmonious coexistence of urban environment with nature: river arteries, green parks, neighborhoods of birds, animals, and waterfowl feed cities with natural energy, balance anthropogenic impact, and neutralize smoke, pollution, car noise. But in the face of powerful growing urbanization, the degradation of the natural component is a sad reality.

Improving the environment is directly affected by the rehabilitation of our river systems - rivers and their coastal areas.

This article is a continuation of the vector on the study of river ecosystems in order to revitalize the coastal areas of our rivers and reservoirs. In previous papers, the author

considered the state of Kyiv, Lybid, Stugna, Dnieper floodplains, coastal areas of Kyiv region, studied the problems of small river ecosystems, proposed methods of revitalization of small river ecosystems.

2. Main Part. Principles of Organization of Coastal Areas

Urban organization of coastal areas occurs in three directions - it is urban, landscape and integrated principles [1]. The analysis of world practice shows that in general the urban type of design of coastal territories with dominance of engineering and technical constructions, designs of shore protection, elements of accomplishment prevails. But in order to preserve the ecological balance and uniqueness of the river ecosystem, the development of the landscape direction should be more active, aimed at the maximum preservation of natural landscapes, the creation of unique architectural and landscape objects. This will contribute to the sustainable development of the urban environment.



Figure 1. Organization of the coastal area. Rotterdam. Netherlands.

2. Chicago River walk. The embankment, 24 km long, is a different type of space, with a wide range of leisure activities. The design of materials, details and repetitive shapes ensure the visual unity of the whole project. The highlight of the promenade is the multi-level terraces (Chicago, USA, architectural bureaus Ross Barney Architects 2009 - 2015). The project aimed to reconstruct two areas in the harbor and create two different levels of pedestrian promenades over the water. The newly created recreation area consists of two large areas that overlook the sea and are oriented according to the sun and wind rose. A pier has been built in the southern part, which is being converted into a platform for public art events. There are opportunities for water sports (Copenhagen, Denmark, JDS Architects and KLAR Architects, 2008-2013).

XaHaffency waterfront, located in the new district of Hamburg in the former port area. The total length of the promenades is about 10 km (Germany).

1. The city promenade in Oslo in the Acker Bruges area is an open public space with shops, cafes and places to relax (Norway, Stranden project, architects LINK Landskap, 2014).
2. The Bund was a multi-lane highway (1.5 km along

2.1. Urban Principle

The embankments, organized in the urban direction, have clear geometric lines, rhythmic composition. The natural components involved are only a small part of the architectural solution - they are concise, but can also be bright dominants, create a rhythm, add landscape color to the architectural composition. The nature of urban design can be traced in the drawing of the shoreline, materials and techniques, vertical planning, small architectural forms, lighting system. Prominent examples of the urban principle of shore organization are the following [2-5]:

1. Cop Van Zuid in Rotterdam. The abandoned territory of the peninsula on the right bank of the Maas River, located in the central part of Rotterdam, has been transformed into a multifunctional space with a river taxi, an expanded tram network, a new metro station and the Erasmus Bridge, which is now one of the city's symbols.

the Huangpu River) with underground pedestrian crossings and heavy traffic until 2008. A high-speed highway (hi-wei) with overpasses overlooked the embankment. As a result of the reconstruction, the highways, part of the lanes, overground and underground pedestrian crossings were eliminated. The pedestrian zone has been transformed and expanded. A tunnel has been laid under the river as an alternative route for cars (Waitan, Shanghai, China, Reconstruction, 2009). [6].

Other examples of urban planning in coastal areas are: DaniaPark (Malmö, Sweden, Thorbjörn Andersson); Wharf of Austerlitz Marina (Paris, France, 2012); Pearl River Beer Factory Landscape (Guangzhou, China, AteliercnS).

2.2. Landscape Principle

Preservation of natural resources is extremely important for sustainable urban development, as it is a guarantee of improving the ecological situation, a resource of the natural environment, a condition for providing psychological relief, which is essential for megacities. Coastal areas, which have preserved landscape areas in their natural state, form "green corridors" of connections in the ecological framework of the city.

The aim of projects based on the landscape principle of coastal organization is to create a space as close as possible to natural. This is facilitated by imitation of the laws of natural shaping with the use of natural materials (wood, stone). Most often, the natural contour of the shoreline is preserved. The peculiarity of this direction is the creation of both natural and man-made "picture" of the coastal landscape. In the case of artificial creation of the natural environment, the coastal landscape is as close as possible to natural forms. The inclusion of urban elements should not dominate the natural component; they must harmoniously complement the natural environment, become an organic part of the coastal landscape. Such a landscape environment is formed in park areas, public areas, public spaces and recreation areas, where elements of sports infrastructure are desirable [7]. Illustrative examples of coastal landscape organization are the following:

1. Riverside Lunen. The green space project has created a coastal park that starts from the city center along the Lippe River. The hydro park has two levels, which are connected by trails that allow you to admire the beauty of the landscape of the river and the coastal area (Lünen, Germany).
2. Perreux river banks. The project aims to combine people, plants and animals with the Marne River ecosystem. In the city of Perre-sur-Marne, the river is an important factor in environmental, social, urban, political issues. For a harmonious perception of coastal design, concrete fences have been transformed into green engineering structures (Le Pere-sur-Marne, France).

2.3. Revitalization of River Ecosystems on the Example of the Chongcheon River in Seoul

Projects to revive natural ecosystems in cities are



Figure 2. Revived Cheoncheon River. Seoul. South Korea.

River and coastal revitalization has also led to transport reform with traffic restrictions through central Seoul; landscaping of the embankment together with the water area has improved the microclimate of the city. The problem of insufficient water filling of the river was solved by pumping water (about 10 times a year) from another city river Hangan. Thus, the successful revitalization of the Chongchon River is the return to life of the water area along 6 km, 13-19 m wide, improving the living conditions of the inhabitants of urbanized Seoul. In economic terms, the revival of the river

has become relevant. This ecological vector in the urban planning sphere began with the revitalization of urban rivers - "blood vessels" in the body of the city. The return of rivers to their natural qualities - natural bed, flora, fauna, ecotones - will improve the atmosphere of the urban environment, microclimate, create recreation areas for citizens.

A clear example of the successful implementation of the revitalization project is the revival of the Chongqing River in Seoul (South Korea). This river was the main artery around which Seoul was formed. In the middle of the twentieth century, after liberation from Japanese colonization, the Chongcheon River looked like a sewer; it was hidden under a concrete highway. At the end of the XX century, the economic rise of Seoul began and there was a demand for a happy urban future of the city. The metropolis needed a modern project of international level, which was to help raise the status of Seoul. The revival of the Chongcheong River, a hidden "blood vessel" of the city, realized this progress [16].

Despite the usual criticism and skepticism, in 2003 the project of the architectural firm Seo-Ahn Total Landscape was approved. During the 2 years of ongoing revitalization, hydraulic works were performed, air bridges were built, underground connections between the shores, the coastal area was turned into a valuable area of public space. The 6 km pedestrian promenade has been divided into several walking routes: the Garden of Stones, an area with reproductions of works by 18th century artists, an area of contemporary artists, a historic site with a presentation of ancient Seoul life, the Wall of Desire, where residents live. Seoul is carving out its dreams. City holidays, parades, fairs are held on the embankment (Figure 2).

has provoked business activity in its coastal area - the number of small businesses has increased, the cost of land has almost doubled [17].

This successful project also inspires Ukrainian architects. The mayor of Kyiv has already signed an order to establish Pochayna Park in Kyiv's Obolonskyi district with the revival of the small Pochayna River. Today, the river has been transformed into a system of 6 Opechen lakes, which are connected by concrete collectors, only a small section of the river with a natural flow has been preserved (Figure 3).



Figure 3. Pochayna River. Ukraine. Project to organize Pochayna Park in Kyiv.

The Jordan Stream, Pochayna's most famous tributary, flows at the foot of Mount Yurkovytsia [18]. The winner of the all-Ukrainian competition was the project of creating a park with revitalization of some sections of the river Pochayna: raising part of the river to the surface in the area near Lake Jordan, releasing the river from a concrete tray in another area, the natural channel Pochayny should clear, restore ecotonic component. To implement the project, it is necessary to agree on land management, enter into an agreement with the authors of the project and, most importantly, allocate sufficient funds. For example, \$ 380,000,000 was spent on the revitalization of the Chongcheong River [19].

Today, Kyiv architects are collaborating with Korean specialists who have implemented a project to revive Chongqing in Seoul. Pochayni Kyivans do not see noticeable results in revitalization yet, but the work is underway and we certainly hope for the successful completion of the project to revive our baptismal font in Russia. Kyiv pleases and inspires the given ecological vector of development of our city, the beginnings of the revival of aquatic ecosystems, because the water network of the city of Kyiv has about 426 objects. It is important to understand the basin principle of revitalization - the revival of the river together with its coastal area.

In addition to the obvious benefits of improving the microclimate of the urban environment, restoring historical

and cultural significance, the emergence of recreational and pedestrian areas, public space (city friendly for people) revitalization of rivers will have long-term economic benefits - coastal areas of revived waters investment. Seoul's experience is a shining example of mutual understanding and cooperation between the city government, the public and business.

2.4. Integrated Principle

The most flexible and promising approach to the creation, revitalization and development of coastal areas is a combination of urban and natural areas. Examples are:

1. Hornsbergs strandpark in Stockholm. The project won the Swedish Sienapriset Award in 2012. The park with a length of more than 700 m consists of 4 parts. The soft shorelines level the water border, which is reinforced with concrete slabs that turn into natural stones. 3 floating waterfront piers allow visitors to get as close as possible to the water. Bathing areas, sunbathing piers, showers, cycle paths, barbecue areas, free spaces and facilities for various events - all in this park are adapted for recreation of citizens and guests of Stockholm. Landscaping of the park is represented by plants that are typical representatives of this region, with a touch of single exotics (Figure 4).



Figure 4. Coastal Organization, Stockholm.

2. The Madrid Rio project, implemented under a road network reconstruction program launched in 2000, is the reconstruction of the M30. This section of the ring road, laid in 1960-70, did not improve the road situation in the capital, and later became a barrier that protects the southern and western parts of Madrid from its center, which caused their economic decline. During the reconstruction of this section, the road was removed into an underground tunnel, and the vacated coastal areas were transformed into a linear park, which includes many landscaped areas, sports and children's

playgrounds, hiking trails and bike paths. The area of the project was about 700 hectares (of which about 50 hectares of embankments). Thanks to its implementation, it was possible not only to improve the ecological situation in the city, to restore its integrity, but also to provide a new image of the capital - attractive for both residents and tourists (Madrid, Spain, West 8 (Netherlands), a team of architectural bureaus - MRIO Arquitectos, 2007-2009) [8].

Illo Pompidou Embankment. According to the project concept, the section of the route from the Orsay Museum to

the Alma Bridge has become pedestrian. A new public space with floating botanical gardens, cafes, sports grounds, play

areas for children, recreation areas was formed here (Figure 5. Paris, France, 2013).



Figure 5. Organization of the Seine embankment, Paris. Paris Beach Project.

3. The favorite place of street leisure for residents and guests of the Danish city of Aarhus is the public space of the coastal zone of the river of the same name. The coastal area of the Aarhus River became a popular walking area in the mid-1990s after the dismantling of the city highway covering the river since 1930 and the conversion of the banks for recreation. The reconstruction was extremely successful, as a new public space appeared and economically successful, because the value of real estate on both sides of the river doubled (Figure 6) [15].



Figure 6. Revitalization of the Aarhus River, Denmark.

Interesting large-scale integration projects in the formation of coastal areas are also [8-14]:

- a. Westharlem Piers Park (Harlem, New York, USA, W-Architecture);
- b. The Edge Park (Brunklin, NY, USA, W-Architecture);
- c. Hammarbru Shostad district (Stockholm, Sweden);
- d. Glebe Foreshore Walk (Sydney, Australia, JMD design);
- e. Cabecera Park (Valencia, Spain).

The interaction of the transformation of coastal areas should be used as a tool for the harmonious inclusion of coastal areas in the modern structure of the city for sustainable urban development.

3. Methods of Urban Organization of Coastal Areas

The main methods of urban organization of coastal areas are as follows:

- a. the formation of coastal areas of a holistic multifunctional system of recreation and public spaces in combination with pedestrian, "green", "water" zones; development and transformation of the coastal strip together with the water area into a system of pedestrian routes with the help of engineering structures,
- b. organization of bicycle infrastructure;
- c. development of "water" infrastructure: creation of walking and excursion routes, city water transport, berths, piers, yachting, parking of water-motor transport, and also creation of expositions of historical vessels accessible to visitors;
- d. preservation, restoration and development of "green" architecture of coastal areas: the formation of an integral continuous landscape infrastructure that combines natural landscapes, parks, boulevards, squares, pedestrian areas; combination of means of landscape architecture with natural components; organization of nature reserves,
- e. zoning of coastal areas with the organization of areas of active and quiet recreation, children's play and sports complexes;
- f. development of service infrastructure based on modern technological solutions, principles of preservation and development of architectural and
- g. organization and equipment of observation decks in places that provide the best conditions for the perception of water panoramas;
- h. development of coastal areas as complex objects of culture and tourism; use of moored vessels as available for visiting multifunctional facilities; organization of tourist and walking routes.

4. Conclusions

Against the background of rapid processes of urbanization, the tendency of returning to water bodies their extraordinary significance in the life of the city becomes especially relevant. For each city with a unique

natural basis, the connection with the water space determines the historical process and patterns of development, structure and architectural appearance, cultural traditions and way of life, typology and status of urban spaces. Among the current three areas of organization of coastal areas - urban, landscape and integrated, the most promising approach to the transformation and development of coastal areas is an integrated area. Combining the qualities of urban and landscape environment, it allows you to restore the natural component and create new urban public, pedestrian and recreational spaces for urban residents.

Revitalization of river ecosystems restores the historical and cultural significance of rivers, which is directly intertwined with the history of cities. The revival of rivers in cities with the creation of public spaces and landscaped recreation areas in coastal areas will improve the quality of urban space, living conditions, give a sense of harmony and happiness to residents. The main core of these projects for the organization of coastal areas is respect for people, their needs, care for the human dimension.

5. Recommendations

An important component of comfortable living conditions in cities is the harmonious coexistence of urban environment with nature: river arteries, green parks, neighborhoods of birds, animals, and waterfowl feed cities with natural energy, balance anthropogenic impact, and neutralize smoke, pollution, car noise. But in the face of powerful growing urbanization, the degradation of the natural component is a sad reality.

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