Foreign and Domestic Experience in Environmental Planning and Territory Management

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Abstract. The given article considers the causes of the emergence of territories in need of environmental planning and management worldwide. The ways of development of industrial territories in historical areas of cities are presented. It is shown that environmental planning and territory management contribute to the improvement of the quality of life, the development of new kinds of activities, the solution of transport and environmental problems. The experience of Great Britain, Germany, the USA and Russia is analyzed and examples of environmental planning and territorial management projects are presented. The article considers the cases of reorganizing the former industrial buildings and territories and creating residential complexes, shopping centres, museums, exhibition spaces, coworking, sports facilities, recreational spaces and leisure centres in them. Both successful redevelopment projects and those the implementation of which has been discontinued are identified. The release of the city’s territories from industrial facilities is considered to be the most important task of forming the urban environment, since the existing location of industry does not correspond to the tasks of developing urban infrastructure and worsens the ecological condition of the city.

1. Introduction

The formation of the majority of cities lasted for centuries. Cities grew out of small villages, but this happened only if the location of the latter was favourable. In this context “favourable” means the availability of natural resources or location close to trade routes. The development of such settlements was accompanied by the construction of plants and factories, the emergence of a rail service, the creation of a railway station, port, and warehouse infrastructure. According to modern standards, the majority of the above-mentioned infrastructure objects are located in the central and most expensive parts of cities, where using them as intended is not only inefficient, but also damages the modern environment, worsens traffic situation, creates environmental problems. The solution to the current problem is the withdrawal of industrial enterprises from the city’s territory and the subsequent redevelopment of the vacated territories. Redevelopment contributes to the improvement of the quality...
of life, the development of new kinds of activities, the solution of transport and environmental problems. That is why redevelopment of industrial areas is one of the key principles of green building.

Industrial zones have great potential for the development of urban infrastructure. For the rational use of redevelopment, it is necessary to analyze the existing international and domestic experience in it, which is the purpose of this work.

2. Methods
The methodological basis of the study is an integrated approach that includes the study and synthesis of literature and Internet sources on the development of urban environment, urban policy, cluster approach in territory planning, redevelopment, environmental planning and territory management. The instrumental and methodological apparatus of this study is based on a combination of basic methods of general scientific and natural science cognition, both empirical and theoretical. These methods include comparative historical analysis, normative analysis, comparative analysis, economic analysis, synthesis, abstraction, system analysis and synthesis, observation.

3. Results

3.1. The analysis of foreign experience in the field of redevelopment of territories
In the middle of the last century, in Europe and the USA, there was a desire to revive industrial areas fallen into decay, which was called redevelopment. No matter how management and use of real estate was carried out in Russia [1], there also were industrial areas sunk into degradation. Therefore, it is useful to consider the world experience in solving the problem of redevelopment.

3.1.1. Great Britain. Creative clusters started to appear in the UK in the late 1990s. Their development took place within unused industrial areas which were transformed into urban spaces, convenient for living from an infrastructural and ecological point of view. There are more and more examples of cluster improvements in the UK every year. One of such examples was 17 hectares of port quarters with docks of historical significance in the centre of Liverpool, which were subject to complex restructuring. The place called The Paradise Project turned into a cultural, business, as well as a tourist center of attraction for many residents and guests of the city [2].

Another example is the creation of a centre of attraction through the transformation of the Templeborough steel mill in Rotherham into Magna Science Adventure Centre. The territory of 25.2 hectares, located on the outskirts of the city, was developed in the framework of the British Millenium Program. Now in the centre of Magna are located informative and thematic pavilions, museums, dedicated to four primary elements (Earth, Air, Fire, Water), contributing to the production of steel [2].

The Eden Project, a botanical garden with greenhouses, was created on the territory of the former clay pit in the county of Cornwall. A previously unattractive place is now in demand every year for the Eden Sessions summer music festival.

3.1.2. Germany. As for redevelopment in Germany, there are a number of interesting and successful projects implemented in the territories of former plants. For example, one of such projects is the 4-star hotel East, established in a rebuilt steel plant in the city of Hamburg.

In the Olympic Park of Munich, located in an area called Oberwiesenfeld, before the reconstruction, which took place in the first half of the 20th century, there was a military training ground, an airfield, and an aircraft engine factory Bayerische Motoren Werke (BMW), reoriented to the auto industry after World War II. The main problem of the plant was low profitability. In the process of redevelopment, a large multifunctional centre of great importance for the whole city with a uniform landscape appeared within the former 300-hectare BMW plant. The Olympic Stadium with a capacity of 80 thousand people, a swimming pool and a gymnasium, located on a raised earthen
platform and enclosing the main Olympic square in a semicircle in the north, have grown in this area [4].

3.1.3. USA. In 1945, the state of California adopted the California Community Redevelopment Act, which is still relevant, despite the fact that in the course of time it has undergone changes. Redevelopment in it is interpreted as a tool for the reconstruction of settlements (city units) using its own capital and outside funds. The main goal of redevelopment is “increase in the financial independence of the territories and the formation of their economic independence, which indirectly also implies solving social, environmental and institutional problems” [5].

It is believed that redevelopment appeared in the USA at the time of the first projects aimed at revitalization of obsolete areas and inefficient territories. It was the period when companies started to buy outdated enterprises, old houses, and turn them into economically and aesthetically attractive real estate.

The most famous transformation happened to the High Line, an elevated park in New York. 10-meter-high metal piles on which the railway line passed over the streets of two western quarters towered in the park up to 1980. The closure of the railway took place in the middle of the 20th century as the result of deterioration of the ecological situation in the city, partly caused by the operation of the abovementioned railroad. The process of metal corrosion and the threat of collapse of the old bridge made the problem of dismantling extremely acute. The construction of a modern unusual park began in 2006. The authors of the project sought to unite nature and industrialization by planting more than 200 species of plants along the railway lines. Stunning views of the Hudson River and the city are also considered to be a great advantage of the project [5].

3.2. The analysis of domestic experience in the redevelopment of territories

Nowadays there is a shortage of undeveloped territories in the major cities of Russia. The reason for this is the construction boom that has engulfed megalopolises in recent years, but the lack of residential and commercial real estate is still present in the vast majority of regions of the Russian Federation. In the 20th century, the prevailing majority of Russian industrial cities were built around factories, plants and other city-forming enterprises. Million-plus cities developed gradually, industrial areas were formed around the existing historical centres of the city, residential areas were built around the factories due to an increase in the population.

3.2.1. Moscow. The impetus for the development and reorganization of the industrial territories of Moscow was the Program for the Development of Industrial Territories adopted in 2004. At the moment more than 7 thousand hectares (17% of the urban area) are built up with more than 70 production facilities that have not been used for a long time or have obsolete production, and therefore partially function as a rental business (provision of class “C” premises) in Moscow.

The number of successful examples of the redevelopment of industrial areas in Moscow grows year after year. Vivid examples are Moscow Metallurgical Plant Serp i Molot, Plant ZiL, silk mill Krasnaya Roza, transformed into business centres. The project of Novospassky Dvor business quarter, which was implemented in a former textile factory, is another successful instance of redevelopment.

Not all redevelopment projects are successful. An example is a projected administrative building Greendale, Oktyabrskaya St., 98 in Moscow, with an area of 35,000 square meters. The building is situated within the former aluminum alloy plant area. In accordance with the name, a lot of attention is paid here to green environment. There is a recreation area on the roof of the building, the surrounding area is effectively landscaped. In 2014, the complex took 2nd place in Green Awards, the Russian competition for environmental development. The building has a certificate of environmental performance BREEAM International 2013. However, the building has not been constructed yet.

3.2.2 St. Petersburg. The New Holland Island, a small artificial island created under Peter I in 1719 for warehouses, is of the greatest interest in the sphere of redevelopment of industrial areas. Throughout
its history, the island was closed to visitors, but in 2004, it was given to the city. A tender for reconstruction was immediately announced, but the investor went bankrupt. The second competition was held only in 2010. The main concept of the space was the creation of a park area, with the placement of commercial space in reconstructed historic buildings. Now only the park area has been reconstructed, however, it is planned to gradually introduce into service the remaining objects of the island until 2025. New Holland is a strategically important cultural centre of St. Petersburg [6].

Table 1. The most important redevelopment projects in St. Petersburg.

| Name of the project, address | Historical use | Current use | Date of construction / Date of redevelopment |
|------------------------------|----------------|-------------|---------------------------------------------|
| Petrovsky Estate on the Water, Petrovsky pr., 26 | Rope factory, ship-building yard | Business class residential complex | 18th century / 2019 |
| Galeria shopping centre, Ligovskiy pr., 30A Lumiere-Hall creative space, Obvodnogo Kanala emb., 74A | Blacksmith’s shops, button factory, palace of culture | Shops, consumers services | 18th century / 2010 r. |
|                             | Gas holder (gas storage) of the gas plant | Planetarium, art space, museum | 1884 / 2016 |

Other significant redevelopment projects of St. Petersburg include *Tkachi* Creative Space, which is situated in the former paper and textile manufactory; Palazzo and Riverside residential complexes, located in the former iron-foundry and aircraft factory respectively; *Etagi*, *Artnuza* and ContourFamily creative spaces which were established in the former Smolhinskiy bread plant, *Muzdetal* musical instruments factory and the department of OAO (OJSC) *Lenpoligrafmash*, respectively; Erarta Loft Museum, established in the former Synthetic Rubber Research Institute named after S. V. Lebedev.

4. **Discussion**

Historical appearance, planning organization, social, transport, economic infrastructure of cities are individual and unique. However, changing realities of life, migration of the population, requirements for improving the quality of life, caring for the environment, changing economic relations and logistics channels, closing enterprises, changing the functioning of entire industries lead to the need of reorganizing urban spaces. An example of such reorganization is industrial redevelopment of territories as an element of environmental planning and management of territories.

The California Community Redevelopment Law was adopted in 1945, so this year can be considered as the year of birth of redevelopment concept. Since then redevelopment process has been carried out in many countries, including Russia. Examples of successful projects include the Paradise Project in Liverpool, the UK; Templeborough (Magna Science Centre) in Rotherham, the UK; the Eden Project in Cornwall, the UK; Silvertown Park in London, the UK; East hotel in Hamburg, Germany; Olympic Park in Munich, Germany; High Line Park in New York, the USA; *Serp i Molot* and *ZIL* plants as well as *Krasnaya Roza* factory, transformed into business centres, in Moscow, the Russian Federation; New Holland space, Galeria shopping centre, residential complexes Petrovsky Estate on the Water, Palazzo and Riverside, *Tkachi*, *Etazhi*, Erarta, Lumière Hall, ContourFamily, *Artnuza* creative and art spaces in St. Petersburg, Russia. There are also unsuccessful projects, for example, Greendale business centre in Moscow, the Russian Federation.

Urban scientists predict further growth of urban settlements and the formation of their agglomerations. The quality of living conditions in such cities will depend on planning and management of territories in them. That is why the study of the development processes of the territories of cities, all stages of their life cycles, including redevelopment, examples of ongoing
projects is the most important task for ensuring sustainable development and favourable climate of the country.

Both external and internal factors affecting the implementation of redevelopment projects are subject to further study. The relationship between the team that implements redevelopment projects and stakeholders, as well as the impact of the political and economic climate on redevelopment projects, are also subject to study. It is necessary to consider the introduction of modern methods of processing, using and storing information on projects [7, 8, 9]. Special attention should be paid to the formation of income and expenditure indicators of projects, the alternative use of space [10, 11], the introduction of new technologies into management processes [12-16] and risk analysis [17-24], for example, using both state and private partnerships or mechanisms for creating branded properties for corporations.

5. Conclusions
In the central areas of a lot of cities there are territories, the historical use of which does not correspond to the current development of the surrounding territory — these are sites of factories and plants, railway, port, and warehouse infrastructure. The continuation of the use of such territories in accordance with their historical functions is inexpedient, since it impairs the quality of life, transport logistics, aesthetic appearance and ecological parameters of cities.

The solution to this situation is the withdrawal of industrial enterprises from the city and the subsequent redevelopment of the vacated territories [25, 26]. Redevelopment helps to improve the quality of life, develop new kinds of activities, solve transport and environmental problems. There are investment-attractive projects of residential complexes, shopping centres, coworkings [27], socially important sports facilities, museums, exhibition and art spaces [28], recreational spaces, and leisure centres in the territories that received a new life.

Therefore, the redevelopment of industrial areas is one of the key principles of green building.

The most important task of forming the urban environment is to release the city’s territories from industrial facilities, since the existing location of industry does not correspond to the tasks of developing urban infrastructure and worsens the ecological condition of the city.

Industrial zones have great potential for the development of urban infrastructure. For the rational use of redevelopment, it is necessary to analyze the global and domestic experience in the implementation of such projects. There are examples of successful implementation of redevelopment projects all over the world in the UK, Germany, the USA and Russia.

Comprehensive redevelopment of industrial zones is designed to create new jobs, new living spaces, science parks and to develop infrastructure and transportation. Due to competent environmental planning and management of territories, the comfort of living and working will increase.

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Acknowledgments
This paper was financially supported by the Ministry of Education and Science of the Russian Federation on the program to improve the competitiveness of Peter the Great St.Petersburg Polytechnic University (SPbPU) among the world's leading research and education centers in the 2016-2020.