

REVITALIZATION OF DEGRADED AREAS AND FACILITIES IN THE CITIES OF CORE OF THE METROPOLIS GZM

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Abstract

The subject of the paper is the revitalization of urbanized areas, considered in terms of the importance of degraded areas and objects that require adaptation, protection, and creation measures in this process. The research focuses on cities belonging to the core of the Metropolis GZM – Poland's first metropolis whose industrial origin, history and dynamics of development make it necessary to carry out revitalization activities. To conduct the research, the available source materials were collected and analyzed, including planning documents, information portals, scientific articles and items, cartographic and photographic materials. The collected information was compiled according to the adopted functional criteria. The research aims are to identify the implemented and planned revitalization activities, analyze their distribution in the context of individual cities and the entire core of the Metropolis GZM, and as a result assess their impact on the direction of city development and the quality of life of the inhabitants of the post-industrial metropolis.

Keywords: Revitalization; Adaptation of degraded facilities; Degraded post-industrial areas; Post-industrial cities; Metropolis GZM.

1. INTRODUCTION

1.1. Research background and purpose

Post-industrial cities can be called special cities. Highly industrialized and urbanized, with a high population density and a significant degree of degradation of the natural environment, they are particularly susceptible to transformation. Their conditions resulting from their characteristics, historical processes and the dynamics of development can stimulate and direct these transformations. The changes that have been taking place in post-industrial cities over the last several decades depend on the degree of economic, social, and cultural development. The planning, financial and organizational instruments used are also important. They lead not only to the restoration of

urban systems to full efficiency but also to the creation of a new identity and a new image of cities based on post-industrial heritage. The revitalization activities undertaken in degraded areas and facilities are part of this process. Taking advantage of the opportunities inherent in them, on the one hand, gives a second life to the urban tissue, and on the other, prevents the dispersion of buildings, reduces urbanization pressure on open areas, enables the maintenance of the continuity of natural systems, changes the image of urbanized areas and improves the quality of human life and the surrounding environment. Some of these areas gain new functions, others require protection of the value of cultural heritage or protection against over-investment, while others, revitalized towards nature, may become a place of rest and recreation for people, a

reservoir of local biodiversity and a place where rare species, plants and animals occur. These activities are part of the transformation and development of post-industrial cities towards sustainable cities, caring for their identity, spatial order and architecture, ensuring attractiveness of the environment and living, and high quality of life. Their effects are visible in the landscape, they also affect the labor market, the attractiveness of urban spaces, the quality of recreation and living in urban communities.

The subject of the paper is the revitalization of urbanized areas, considered in terms of the importance of the degraded areas and objects that require adaptation, protection and creation measures in this process. The research focuses on post-industrial cities belonging to the core of the Metropolis GZM – one of the most industrialized, intensely urbanized and densely populated cities in Poland, whose transformation is a representative example of the revitalization of post-industrial urbanized areas. They were based on research conducted by students of the first year of the master's degree studies in the field of Architecture, as part of the course "Renovation of degraded urban landscape", conducted under the supervision of Alina Pancewicz, in the academic year 2020/2021, in the Department of Urban Planning and Spatial Development, Faculty of Architecture, Silesian University of Technology.

The paper aims to identify the implemented and planned regeneration activities, analyze their distribution in the context of individual cities and the entire core of the Metropolis GZM, and as a result assess their impact on the direction of development of post-industrial cities and the quality of life of their inhabitants.

1.2. Literature review

The issue of revitalizing degraded areas is an inseparable part of the research conducted in various Polish research centers. These studies concern many aspects, including methods of restoring post-industrial areas and facilities, spatial analyzes of revitalized areas, transformations in connection with economic and economic changes, social, natural, and cultural aspects, as well as revitalization analyzed in the context of the development opportunities of the region and individual cities. Selected issues taken up by representatives of many fields of science: architecture, urban planning, biology, geography, or sociology show the problem of revitalization in the context of a given field of knowledge and relate to various spatial

scales, ranging from global, through national, regional, to local [1, 2, 3, 4, 5, 6, 7]. Many issues presenting the views of Polish architects, town planners and planners on the issues of revitalization of degraded urban areas were discussed in the series of publications "Revitalization of Polish cities" (2009–2010) [8], collective works edited by P. Lorens (2007) [9] or Z. Ziobrowski's (2000) [10]. Research considered in the context of the transformation of post-industrial and degraded areas was undertaken, inter alia, by K. Gasidło (1998) [11]; K. Gasidło, J. Gorgoń (1999) [12]; in the context of planning and implementation by P. Lorens (2010) [13]; in the context of the renewal, image, and identity of a post-industrial landscape by A. Pancewicz (2011) [14]; Sz. Opania (2012) [15]; in the context of instruments and tools – B. Domański (2009) [16] or in the context of ecological solutions related to climate change adaptation by K. Mazur-Belzyt, R. Karwalska (2020) [17]. Among the sources, studies relating to the Silesian Voivodeship, including cities belonging to the Metropolis GZM occupy a special place. Research in the context of achieving social, economic and environmental benefits resulting from revitalization of the degraded areas, including post-industrial areas, was undertaken by W. Jarczewski, M. Huculak, W. Śmietana (2010) [18]; in the context of provincial databases on post-industrial and degraded areas – E. Zagórska (2013) [19]; in the context of innovative solutions for the revitalization of the degraded areas – J. Skowronek ed. (2014) [20]; in the context of the impact of the revitalization activities on the development opportunities of the region – T. Adamski, R. Orpych (2011) [21] and B. Domański (2003) [22] or the attractiveness of the region A. Starzewska-Sikorska, (2008) [23]. Research showing the relationship between regeneration activities and their location in cities in the Silesian Voivodeship was carried out by a team of authors: W. Jarczewski, M. Huculak and W. Śmietana [18, 24]. They became the starting point for conducting extended research on revitalization activities undertaken in the cities of the Metropolis GZM core.

1.3. Revitalization of Metropolis GZM cities – planning and strategy

The Metropolis GZM is the first metropolis in Poland that started the implementation of statutory tasks at the beginning of 2018 [25]. Located in the south of Poland, it covers an area that includes 41 cities and communes of the Silesia Voivodeship. The core of Metropolis GZM includes 13 cities with poviats rights,

including: Bytom, Chorzów, Dąbrowa Górnicza, Gliwice, Katowice, Mysłowice, Piekary Śląskie, Ruda Śląska, Siemianowice Śląskie, Sosnowiec, Świętochłowice, Tychy and Zabrze [26, 27]. These are highly industrialized cities, intensely urbanized, densely populated, well-connected with other economic centers in the country and Europe, with well-developed scientific and research facilities. However, taking into account the deteriorating situation on local labor markets, the highest crime risk in the country, significant environmental pollution, as well as a large number of particularly burdensome plants and degraded areas, it can be noticed that over time the economic growth rate of metropolises weakens, and its composition, cities are becoming less and less attractive places to live [28]. The industrial origins, historical conditions, and the dynamics of the Metropolis GZM cities development necessitate undertaking revitalization activities.

1.4. Planning and strategic activities for the revitalization of degraded areas

Activities in the field of revitalization and improvement of the quality of urban space are carried out at various spatial scales. They result from the directions of development and strategic goals included in planning documents. The subject of revitalization has been included in the European Union's policy for the 2021-2027 programming period. It is based on five core objectives, such as supporting innovative economic transformation, low-carbon emissions, increasing mobility, implementing the "European Pillar of Social Rights and balancing development" [29]. "The Regulation of the European Parliament and of the Council on the European Regional Development Fund and the Cohesion" fund of 2018 [30] defined specific objectives related to regeneration for each of the above points and under the "Just Transition Fund" supported productive investments, whose aim is to strive for economic diversification and economic restructuring, but also to create new enterprises, business incubators and other tools to support economic development and the labor market. On a Polish scale, an important document dealing with the subject of revitalization is the "Strategy for Responsible Development until 2020 (with a perspective until 2030)" [31]. As part of the description of the specific objective entitled "Socially sensitive and territorially balanced development", the provisions concerning the improvement of the development conditions of Polish cities and fuller use of the potential of the largest Polish agglomerations deserve

attention. As part of the activities undertaken after 2020, the tasks focused on rational urbanization in metropolitan areas of cities, the use of land for various forms of development, economic activity and services with particular attention to the re-use of brown-fields were specified. In urbanized areas, equally much attention was paid to promotion of participatory approach in decision-making and city management and the implementation of regeneration activities, low-carbon projects, sustainable urban mobility strategies. Silesia, where the Metropolis GZM is located, has been identified as an area particularly experiencing transformation difficulties [31]. According to the Ministry of Funds and Regional Policy, the main goal of the "Program for Silesia" is "to change the economic profile of the region and gradually replace traditional sectors of the economy, such as mining and metallurgy with new ventures in more productive, innovative and technologically advanced sectors" [28]. The need for competitiveness and dynamic development of cities and metropolises has been enshrined in the "National Strategy of Regional Development 2030", the basis of which is "the effective use of endogenous potentials of territories and their specializations to achieve sustainable development of the country, which will create conditions for growth of income of Polish residents, while achieving cohesion in social, economic, environmental, and spatial dimensions" [32]. "The National Urban Policy 2023 Program", which focuses on improving the economic conditions and quality of life of residents, through among other things, enhancing the effectiveness of revitalization activities carried out in degraded urbanized areas, is important for urbanized areas [33].

Each of the above documents relates to economic issues, the principles of sustainable development and improving the quality of life of the inhabitants. Some also detail environmental issues and tackle the issues of poverty and social injustice.

Documents that refer directly to the Metropolis GZM area are of particular importance for the subject of research. Among them, a significant role is played by the "Strategic Action Program of the Metropolis GZM until 2022", adopted in 2018, obligatory for all member communes [34]. This program addresses various aspects of revitalization. It includes, among others, issues related to the revitalization of residential districts (including the use of buildings for TBS and residential buildings), the functional area of the Przemsza and Brynica valleys (the project includes the cities of Metropolis GZM,

i.e. Będzin, Dąbrowa Górnicza, Sosnowiec, Sławków, Siewierz, and Psary) or currently closed mines [34]. The issues of revitalization of degraded areas also refer to the “Urban Climate Change Adaptation Plans” developed in 2019 for 12 cities of the Metropolis GZM core, which take into account the need to link revitalization activities with the process of adapting urban space to climate change [35]. An important planning document, prepared for the entire metropolitan area, will be the “Development Strategy of the Metropolis GZM for 2022–2027 with a perspective until 2035”. The task of the document is to prepare a perspective spatial policy aimed at improving the quality of life and development of the Metropolis [26].

Since 2015, when the “Revitalization Act” entered into Poland [27], municipalities taking revitalization activities may rely on its provisions through “Municipal Revitalization Programs” or based on earlier guidelines, when the basis for the implementation of revitalization activities was a resolution commune councils took on the basis of the act on commune self-government, on “Local Revitalization Programs” [36]. At present, 33 communes have “Local Revitalization Programs in Metropolis GZM”, 6 communes have Commune “Revitalization Programs”, and 2 communes do not have any of the above documents (as of June 2021) [37].

2. MATERIAL AND METHODS

As mentioned earlier, the main goal of the research is to identify the completed and planned revitalization activities and to analyze their distribution in the context of individual cities and the entire core of Metropolis GZM. The method of research on revitalization activities undertaken in the cities of the core of the Metropolis GZM is based on the collection and analysis of available source materials, including planning documents, information portals, articles, and scientific items, cartographic and photographic materials. Its part is to review the collected information and compile it according to the adopted functional criteria. The research covered the last several dozen years and was related to the period when the region experienced the greatest restructuring changes. The results showed the direction of development the individual Metropolis GZM cities are following and what is the impact of the revitalization activities on the quality of living, work and leisure conditions of their inhabitants.

2.1. Revitalization activities undertaken in the core cities of Metropolis GZM

According to the act [27], revitalization is a process of recovering degraded areas from a crisis state, carried out comprehensively, through integrated activities for the benefit of the local community, space, and economy. It covers areas where negative social phenomena are concentrated, including unemployment, poverty, crime, low level of education, or participation in public and cultural life. These areas must also experience at least one of the following phenomena, such as: low level of entrepreneurship and poor condition of local enterprises, poor technical condition of infrastructure, public spaces, buildings, the environment or poor access to services and their low quality.

In the core cities of Metropolis GZM, areas and objects degraded by human activity are an inseparable part of the spatial and functional structure. Post-industrial areas, damaged as a result of the mining and processing industries, dominate among them. They contain a whole range of types of land that have been degraded in relation to their original condition due to various utility functions. These include dumps, excavations, artificial water reservoirs, areas with changed water conditions, areas after old open-cast mining, industrial post-production areas, disused buildings and social and technical infrastructure facilities as well as various types of wastelands [38, 39, 40]. Brownfields are not only a threat to cities, but also a challenge. Many of them can be attributed to new and often attractive ways of development [14]. In the case of post-industrial areas, revitalization covers both the reclamation process and the process of their redevelopment, as a result of which the condition will be restored to fulfil utility functions. It is also a process of social, economic, and natural restoration of these areas to life [11]. Other urban crisis and degraded areas are also subject to revitalization. These include post-communication and post-military areas, elements of municipal infrastructure, degraded housing complexes and public utility buildings. According to statistical data on the Metropolis GZM [41], the share of degraded land in the area of communes in the cities of the Metropolis GZM core ranges from about 6% (6.31 km² per 91.06 km² for Sosnowiec) to 25% (41.25 km² per 164.64 km² for Katowice). This does not mean that the core cities have areas of revitalization proportional to these indicators. For example, Zabrze has the largest area of revitalization in relation to the area of the commune – it is 19.5% [41] (according to the Act on

Revitalization, the area of the planned activities may not exceed 20% of the area of the commune and may not cover more than 30% of its inhabitants) [27, 42]. Revitalization activities undertaken in the cities of Metropolis GZM have been carried out for many years. They began in the period of the political transformation, that is after 1989, when industrial districts with traditional branches of production found themselves in a particularly difficult situation. The conducted research mainly concerns those activities that took place at the beginning of the 21st century [43]. This process is developing dynamically and the number of planned activities is still increasing. Among the crisis areas subject to revitalization processes, the intensely urbanized downtown areas are particularly noticeable, the degree of degradation of which is often related to the concentration of industry, which is no longer listed in the registers, but still physically stuck in the landscape in the form of many degraded areas and objects. These areas constitute a “hole” in the urban structure, causing losses in terms of eco-

nomie efficiency, social cohesion and quality of life. They discourage all kinds of internal investment and push development into green, undeveloped areas. Most of them are located close to the main communication routes – motorways, expressways and railway lines connecting the eastern part of the Metropolis GZM core with the western one. Other activities are undertaken in suburban areas, where areas degraded by industrial activities, e.g. mining, (storage of industrial waste, contamination of soil, water, etc.), subject to its impact (dumps, workings), as well as wastelands, are most often concentrated, fallow land or (post) industrial fallow. These areas, despite the fact that they have great development potential, are less frequently subject to revitalization activities. The area of degraded urban areas renewal designated by the city council, thanks to a local or communal revitalization program, becomes the subject of activities of local communities. The implementation of tasks in the area of the Metropolis GZM core is undertaken by both municipal entities and entrepreneurs or nat-

COMPLETED AND PLANNED PROJECTS FOR REVITALIZATION OF POST-INDUSTRIAL AND DEGRADED AREAS/OBJECTS IN THE CORE CITIES OF THE GZM METROPOLIS

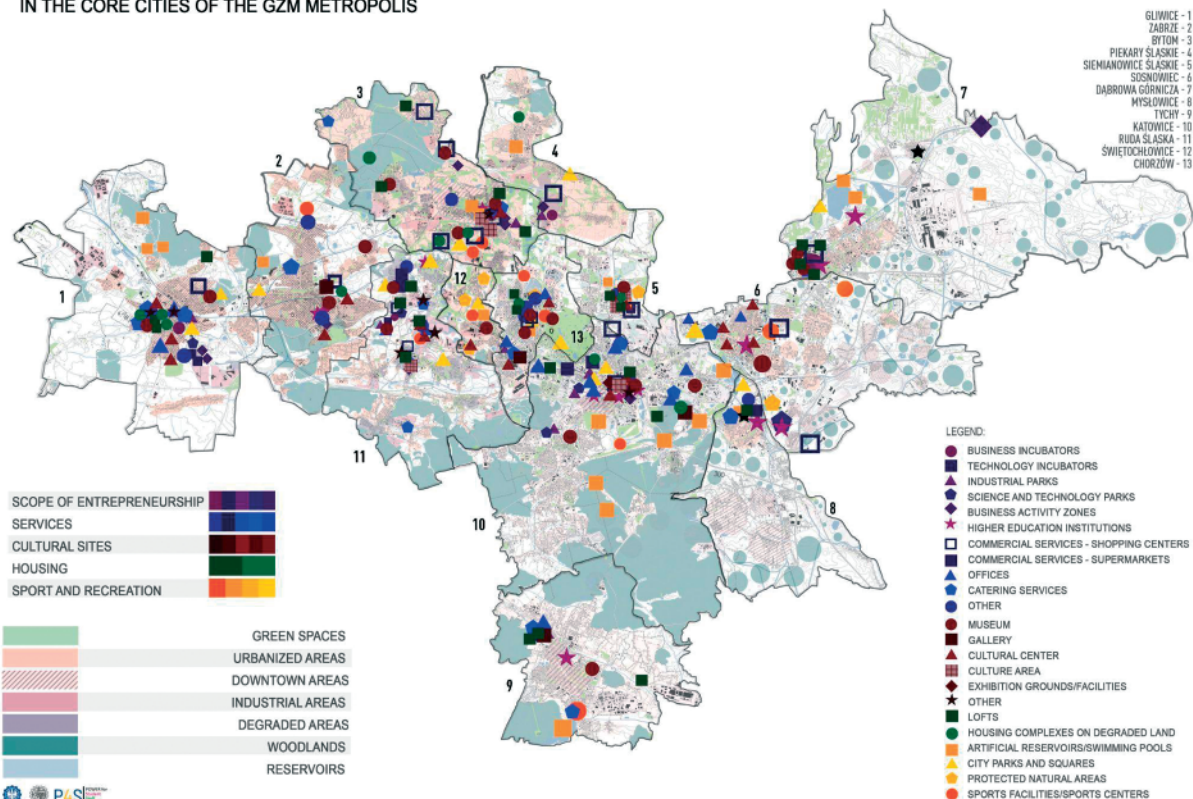


Figure 1.

Completed and planned revitalization projects for post-industrial and degraded areas / facilities in the core cities of the Metropolis GZM – synthesis, by: E. Sarna, D. L'udviková, P. Konior, N. Tadla on the basis of research conducted by first year students of the master's degree programme in the Faculty of Architecture of Silesian University of Technology, in the academic year 2020/2021

ural persons. Private investors are a frequent source of financing, with the support of EU funds, but there are also examples of financing from public funds.

When comparing the studied revitalization activities undertaken in the cities of the Metropolis GZM core, in terms of functional criteria, the following five main directions of activities can be distinguished:

1. revitalization towards the development of entrepreneurship,
2. revitalization towards services,
3. revitalization towards cultural facilities and zones,
4. revitalization towards housing development, and
5. revitalization towards nature, sport, and recreation [44].

The conducted research covered both implemented and planned activities. These include adaptations of individual objects and transformations of entire areas. Many of them, in terms of classification, cover several lines of action.

3. THEORY/CALCULATION

3.1. Revitalization towards the development of entrepreneurship

Regarding the revitalization activities carried out in the direction of the economic development of cities, particular research was done on those in which new functions were introduced, such as industrial parks, science and technology parks, business incubators, technology incubators, economic activity zones, and universities. Their analysis allowed for the conclusion, that the city of Katowice, which aspires to be the capital of the Metropolis, invests in the development of entrepreneurship in particular. Due to the polycentric nature of the region, Gliwice and Dąbrowa Górnicza also have several examples of this type of activity, being almost ex-aequo in the ranking behind Katowice. These are also the largest among the cities of the Metropolis GZM core in terms of the area they occupy (Dąbrowa Górnicza – 188.73 km², Katowice – 164.64 km², Gliwice – 133.88 km²) [41, 45]. Comparing the ratio of the number of investments in the direction of entrepreneurship to other activities, the cities of Siemianowice and Chorzów undertake such activities the least frequently. The city where there is a lack of this type of investment is Świętochłowice, which invests mainly in culture, sports, and recreation. Post-mining areas and facilities constitute a significant part of the transformed facilities and areas adapted in this direction. A different group

of facilities are universities, which are built in buildings with the most diverse functions, including a former casino or the building of the County Employment Agency.

3.2. Revitalization towards services

Among the revitalization activities aimed at service functions, the following were distinguished: shopping centers, supermarkets, offices, catering services, and others (including business centers or religious worship facilities). The location of services in the facilities and areas of degraded cities in the core of Metropolis GZM is most often located near the main communication routes. According to the research, the cities that invest the most in this area of activities, compared to other functions, are the neighboring Katowice, Bytom, Chorzów and Ruda Śląska (9–16 implementations), with the fact that Katowice has the largest number of revitalizations carried out in this area direction. The direction occurring in almost all cities is the adaptation of buildings / areas to the needs of shopping centers. The exceptions are Tychy and the previously mentioned Świętochłowice. Activities leading to the transformation of facilities for the needs of offices and gastronomy are also often selected, sectors of which have been developing dynamically recently (about 40%).

3.3. Revitalization towards cultural facilities

Activities aimed at the development of culture do not dominate in any of the Metropolis GZM cities. This category includes transformations into museums, galleries, cultural centers, areas of culture, exhibitions, fairs, and other areas or facilities, such as e.g. library and theater facilities. In modern adaptations, they often constitute one of the many functions of the entire complex, apart from services, being a space commemorating the history of an object or complex. In terms of the number of activities undertaken, Katowice comes first (9 implementations). In the remaining ones, on average, it is about 5–6 examples of activities, regardless of the size of the city, except for Tychy, Świętochłowice and Dąbrowa Górnicza (2–3 implementations). According to the research, the cities that have not invested in such activities are Mysłówice and Piekary Śląskie.

3.4. Revitalization towards housing development

The conducted research has shown that the adaptation of the degraded areas and facilities for housing is



Figure 2.
Old Steelworks in Katowice, Poland – office space, photo by Natalia Tadla

the least frequently chosen course of action. It was undertaken in 10 out of 13 surveyed cities, on average these are 2–3 examples of this type of activity within the commune. Among the two types of transformations distinguished – lofts and housing complexes located in degraded areas – it is the housing complexes that have more examples of implementation. One of the cities that have invested the most in this direction of activities are Bytom and Katowice, followed by Gliwice and Dąbrowa Górnicza with examples of adapting buildings and areas for lofts and housing complexes.

3.5. Revitalization towards sport and recreation

The development of sports and recreation facilities and areas is the second, after investments aimed at the development of services, in terms of the number of activities undertaken. In the areas of degraded cities in the core of Metropolis GZM, several categories of this type of activities can be mentioned: artificial water reservoirs and bathing areas, parks, and city squares, protected natural areas, and sports facilities and centers. A significant part of the new recreation areas are former workings and artificial water reservoirs, adapted for recreation and bathing areas. The second most numerous types chosen in this category of transformations are parks and city squares, followed by sports facilities. There are also natural areas under legal protection. The reason for this

course of action is often the phenomenon of spontaneous succession, as a result of which new, pioneering habitats and species of animals and plants appear in degraded areas. Sosnowiec and Świętochłowice are cities that chose this course of action more often than others (Sosnowiec has slightly more examples of revitalization towards areas and sports and recreation facilities compared to others, while for Świętochłowice it is as much as 75% compared to other cultural facilities). The largest number of examples can be found in Katowice, which is also one of the cities with the greenest areas (only forests cover over 42% of the area) [45, 46].

4. RESULTS

In the conducted research, a total of 279 examples of revitalization activities carried out in the core cities of Metropolis GZM were recorded, usually carried out from the beginning of the 21st century or planned in recent years. The intensification of activities can be seen in the strip located along the main communication routes on the east-west axis, which results from the distribution of areas and facilities related to industrial activities, the location of mineral resources and development processes typical of agglomerations based on the mining and processing industries. The area of revitalized land varies, from the smallest, such as adaptations of single buildings, to vast areas, such

Table 1.
Completed and planned revitalization projects for post-industrial and degraded areas / facilities in the core cities of the Metropolis GZM, own study

L.p.	The core cities of Metropolis GZM	Directions of revitalization activities					
		Entrepreneurship	Services	Culture	Residential buildings	Nature, sport, recreation	Sum
1	Bytom	6	9	7	6	6	34
2	Chorzów	1	9	6	3	5	19
3	Dąbrowa Górnicza	4	2	3	4	4	17
4	Gliwice	6	8	7	4	5	30
5	Katowice	13	15	9	5	11	53
6	Mysłowice	1	3	0	1	3	8
7	Piekary Śląskie	3	1	0	0	2	6
8	Ruda Śląska	3	11	7	4	3	28
9	Siemianowice Śląskie	1	7	5	3	5	21
10	Sosnowiec	3	5	5	0	7	20
11	Świętochłowice	0	0	2	0	6	8
12	Tychy	3	3	2	3	2	13
13	Zabrze	4	4	5	1	3	17
		48	77	58	34	62	279

as the Silesian Park in Chorzów (over 600 ha), 75% built on degraded post-industrial sites [47]. The city with the largest number of activities and the most developed in almost every direction of activities, and at the same time the largest area, is Katowice. They are immediately followed by Bytom and Gliwice, with a similar number of activities. Piekary Śląskie and Mysłowice have the lowest investments in the adaptation of degraded areas and facilities. Services are the most frequently chosen direction of transformations, while the least frequently are housing functions. The number of activities towards the development of entrepreneurship is only slightly smaller than the number of activities towards culture and sports and recreation. Apart from the housing sector, it can be observed that revitalization activities in the core cities of Metropolis GZM are multidirectional and evenly distributed. This is largely related to the polycentric nature of the metropolis (Table 1).

5. DISCUSSION

5.1. Revitalization and the labor market

When analyzing the planned and implemented regeneration activities, it is possible to notice both their benefits and opportunities for the cities of the Metropolis GZM core, as well as their disadvantages and unused potential [48]. Thanks to the emergence

of new investments replacing large, degraded areas of post-industrial complexes, cities have gained space for the creation of new, more comfortable workplaces and places conducive to social integration. New jobs generate activities aimed at the development of entrepreneurship. One of the examples of this type of investment is the “Nowe Gliwice” Education and Business Center, established in 2008 on the premises of the former coal mine KWK Gliwice. This multifunctional complex includes post-industrial buildings with modern offices, educational and cultural spaces, recreational areas, and adjacent modern headquarters of IT companies and high-tech enterprises. The “Nowe Gliwice” project is being continued and dynamically developing also in other, strategic parts of the city. In 2014, stage II began – revitalization of the former areas of the Wire Factory, and stage III is also planned for works related to the preparation of new investment areas. Special economic zones also have a large impact on the labor market, in the scale of cities and the entire core of Metropolis GZM. New investments located in degraded areas within the Katowice Special Economic Zone provided several thousand jobs in creative industries. The example of Gliwice or Sosnowiec [18] shows that the sustainable management of damaged post-industrial areas in strategic parts of cities, by creating attractive jobs and the possibility of education close to their place of residence,



Figure 3.
Paprocany Lake in Tychy, Poland – canoeing harbor, photo by Karolina Wawrzonowska

attracts creative people who gradually become the driving force of their development. Such activities not only had a positive impact on the quality of life of the inhabitants but also emphasized the direction of creating a new image of post-industrial cities. According to statistical data [45], since 2011, in all cities of the core of the Metropolis GZM, a clear decrease in the value of the share of the unemployed concerning people of working age can be observed, and in the majority of cases – an increase in the number of people working per 1000 population. Revitalization activities in this area can be considered as one of the factors improving the situation in the labor market and leading to an increase in the economic independence of the region.

5.2. Investment in culture

Workplaces are also supplemented by numerous attempts to adapt old forms of buildings and revitalize spatial arrangements to cultural objects and zones, presented in the research. It is the culture that is perceived as the driving factor behind the development of post-industrial cities. In the core cities of

Metropolis GZM, two types of revitalization of facilities and areas for cultural functions can be distinguished: 1. to commemorate the previous function or directly related to it, allowing to generate large tourist traffic, or 2. using the old substance for a new purpose [24]. The areas of the former coal mine KWK Katowice are an example of a combination of the above two types of activities, thanks to the location of the Silesian Museum in post-mining buildings, as well as the construction of new cultural facilities. Together with the buildings of the International Congress Center and the Polish National Radio Symphony Orchestra, the museum creates a showcase of the city of Katowice and one of the most influential Culture Zones in Poland [49]. Thanks to the introduction of cultural functions, high-quality land development and location in the city center, surrounded by residential and service areas and main city streets, this area has become a place accessible to both residents and tourists, significant in the city and region. Activities carried out in degraded areas towards the development of culture contribute to the growth of the identity of a place and determine its attractiveness. Undoubtedly, their consequence is the

interest of potential investors and residents, increasing access to cultural events and contributing to shaping sensitivity to the post-industrial heritage of the region.

5.3. The impact of restoration of degraded areas on the natural environment

The revitalization activities carried out had a positive impact on the natural environment. The problem of pollution and degradation of the environment, and in particular the quality of air, water, and soil, in Metropolis GZM cities is still significant. The presence of large-scale plants and areas degraded by industrial activity, located in the center and on the outskirts of cities, intensively developed transport infrastructure, population density or suburbanization processes cause numerous threats to the natural and built environment [14]. Contemporary civilization challenges, including climate change, contribute to conducting urban policy towards creating resilient and sustainable cities. The process is gradual. Inclusion of degraded areas, which after numerous reclamation, renaturalization or revitalization treatments, ensuring an appropriate form of protection, and entering into a consciously shaped system of green areas, may constitute the basis for harmonious development and sustainable use of urbanized areas [14, 50]. The analyzed examples of activities carried out in Metropolis GZM cities indicate that nature revitalization and adaptation to sports and recreation areas is one of the most frequently chosen types of transformations. One of the examples is the revitalization of the shore of Lake Paprocańskie in Tychy – an artificial water reservoir once created for the needs of industry. The wharf and the canoeing marina, together with the accompanying facilities and elements of land development, allow for active and passive rest for the city's inhabitants, being at the same time one of the greatest tourist attractions [51]. The quality of the implementation ensures that the visitor is not overwhelmed by human interference in nature, and the used shapes and materials enhance the beauty of the surrounding landscape.

An important part of the transformation process and the creation of a new landscape of urbanized areas is taking care of the elements of the natural environment, degraded by industrial activity, and providing them with an appropriate form of legal protection. One of the forms of protection, established in 1997, is the “Żabie Doły” nature and landscape complex, located on the border of Bytom and Chorzów. The reservoirs, hollows and heaps created as a result of

the activity of industrial plants have become a habitat for many species of plants and animals. Thanks to the revitalization completed in 2018, this area has gained new development, such as pedestrian and bicycle paths, observatories, bridges with educational functions and infrastructure conducive to the development of species. Thanks to revitalization activities, more and more degraded green areas, including parks and squares, are gaining a new face. Revitalized in 2018 in Gliwice, Chrobry Park has become a safer place for recreation and meetings for both residents and visitors. Also, Bogucki Park in Katowice, thanks to the revitalization carried out in 2019, in addition to the creation of new bicycle paths and other elements of development, gained several dozen new trees. Taking care of the creation of new natural areas in degraded areas, their legal protection, as well as improving the condition of the existing parks undoubtedly contributes not only to the elimination of pollution and the reconstruction of damaged fauna and flora, but also strengthens the blue-green infrastructure system, prepares cities for climate change, increases the quality of life of residents.

5.4. Revitalization and the living environment

The development of housing in degraded areas and facilities makes up a part of the urban renewal process of Metropolis GZM. An example is the adaptation of a former granary building into lofts or the new “Queen Bona gardens” housing estate – both projects are located in the center of Gliwice. The size of the quarters where they are located helps to isolate the premises from the city noise. The greatest advantage of these and similar solutions is their location, which ensures good access to services, workplaces, and education. Investing in flats in post-industrial and degraded areas is, however, the least frequently chosen course of action. The costs of such implementation in relation to new investments in non-threatening areas increase the escape of residents to non-urbanized areas.

5.5. Service Availability

The last direction of development analyzed is transformation towards services. Post-industrial areas, due to the space they occupy and communication access, are favorable for the creation of shopping centers. Their location brings a quick profit to investors, gives the city prestige [24], and also offers job opportunities. It is worth mentioning the first investment of this type in the region – Silesia City Center, which, as a

result of revitalization in 2005, developed the post-mining areas of the former coal mine “KWK Kleofas” as a shopping center. Currently, it consists of over 300 stores, located on approximately 86 thousand. m², visited by customers and tourists from all over Poland [52]. A great advantage of the newly designed and adapted for services brownfields is multifunctionality, which reduces the effects of unforeseen development activities and significantly affects the quality of life of residents. The revitalized Porcelain Factory in Katowice, located far from residential areas, which is now a place for decorating porcelain products and a science and technology park, also has additional functions, such as a restaurant, a playroom for children or a dentist's office. The problems with the emergence of shopping centers and facilities combining only services are often distances and competition for local small shops. The development of the large-area services sector and little concern for the mixing of functions within residential complexes cause the impoverishment of the local services sector, the disappearance of the identity and attractiveness of existing public spaces.

5.6. Prestige and identity of the place

Many of the projects completed as part of the revitalization activities, thanks to the quality of architectural and urban solutions, emphasized the prestige of the place, gained recognition in the eyes of users, but also were appreciated in various competitions. Examples include the award-winning buildings in the Katowice Culture Zone [49], the development of the eastern shore of Paprocańskie Lake in Tychy [51] or the construction of the headquarters of the Radio and Television Department in Katowice [53]. Some of the projects were entered on the list of the Industrial Monuments Route – opened in 2006 and covering objects related to the industrial heritage of the Silesian Voivodeship. They include, among others The Silesian Museum, the Nikiszowiec estate, the Museum of Zinc Metallurgy – Rolling mill, the Wilson Shaft Gallery and the Porcelain Factory in Katowice [54]. These projects have become an essential part of the region identity and cultural heritage.

5.7. Summary

Despite the increased attractiveness of revitalized downtown areas and the gradual liquidation of degraded areas and facilities, subsequent statistical data on the dynamics of changes in the population number show the growing phenomenon of urban

sprawl [41]. As many as 6 core cities of Metropolis GZM are on the list of the fastest depopulating communes since 2002 [55]. The benefits achieved so far in the form of new jobs, increased attractiveness, and security of some brownfields are not yet sufficient to prevent depopulation of inner-city areas. Due to the fact that the revitalization process has intensified over the last several years, it can be concluded that this is the beginning of significant changes towards improving the quality of life of Metropolis GZM residents, giving an opportunity for better economic and social forecasts.

6. CONCLUSIONS

The process of revitalizing the cities of Metropolis GZM is complex and multidimensional. Significant number of buildings and degraded areas have gained new functions, which has significantly influenced the image of the region and the life of its inhabitants. The activities carried out so far have pursued various goals, such as improving the quality of life of residents, stimulating economic development, or preserving post-industrial heritage, while projects based on the broadly understood promotion of culture have definitely changed the image of metropolitan cities. For many years, the area was viewed as ecologically, aesthetically, and socially devastated by industry. The aforementioned activities, combined with world-class architecture, are constantly changing this picture. Improving the image, caring for the sustainable development and quality of the natural and built environment, has become part of the process of transformation and development of Metropolis GZM cities towards resilient, modern, enterprising, safe, healthy, resource-saving cities, caring for their identity, spatial order, and architecture, ensuring attractiveness of the living environment and high quality of life.

For years, the priority of revitalization programs was to give new life to post-industrial facilities while preserving their heritage, which resulted in an increase in the potential value of investments in such areas and the creation of a kind of fashion for loft offices, business incubators or open-space spaces. The perspective of closing further industrial facilities, will make it necessary to plan further activities. Most urban development programs pay particular attention to the environmental aspect, sustainable development and adaptation to climate change. The revitalization of parks and various types of natural areas will be one of the basic goals of revitalization for the

next years of activities. Therefore, we can expect an increasing number of activities transforming degraded areas into new green areas, strengthening ecosystem services, creating leisure and recreation spaces in cities, supporting local businesses, making the living environment of urban communities more attractive. The changes will also be influenced by the fact that the quantity and quality of public spaces have been strongly verified by the pandemic situation. People deprived of the possibility of traveling began to pay more attention to locating apartments in the vicinity of well-kept parks than, for example, the proximity of cultural facilities. The threat resulting from revitalization activities in Metropolis GZM cities has become the mono-functionality of new investments. Examples are the numerous shopping centers and cultural zones that ceased to function during the pandemic period, creating “dead zones” in cities. The dynamics of the functioning of these spaces can be compared to the functioning of market halls: there is either a huge crowd or an overwhelming emptiness.

An important aspect of revitalization is the issue of improving the quality of life of residents, not only in terms of changes in the material situation but also developing this issue with the aspect of active and passive social participation. The basic responsibility should be civic responsibility in making the elections of representatives, participation in voting for civic budgets and developing the need to care for common space. It is possible to achieve this through appropriate information campaigns and the involvement of residents. All of the above activities depend on the commitment and knowledge of city and metropolitan managers. The aspect of passive and active participation, involving local communities and taking into account the needs and opinions of residents, is also important. Thanks to information, appropriate education and social responsibility, each participant in the revitalization process can have a real impact on the quality and effect of revitalization activities undertaken in the cities of the Metropolis GZM.

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