

The impact of revitalization on the evolution of urban space on former iron and steel works areas in Ruhr region (Germany)

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ABSTRACT

The aim of the paper was to consider the extent of the impact of revitalization on the evolution of post-industrial sites, which manifests itself in morphological and functional changes of urban space. Research was performed on three former iron and steel works areas located in the Ruhr region in Germany: one of the Thyssen's ironworks in Duisburg – Meiderich, the area of steelworks complex Gute-Hoffnungs-Hütte in Oberhausen and the area of the iron and steel works Phönix in Dortmund – Hörde. Methods were applied specific to urban morphology. For each object of study a comparative analysis of the town plan was carried out. Town plans were compared before and after the revitalization process and special attention was paid to land use. This allowed us to observe morphological and functional changes which occurred as a result of the revitalization of the study areas. The research showed that the revitalization of post-industrial space may be conducted in many different directions but irrespective of that it has a huge impact on the evolution of urban space in both a morphological and a functional way. The extent to which revitalization affects morphological and functional structure of urban space depends on the future plan for the spatial development of the site and its attitude to its post-industrial heritage.

KEY WORDS: Landscape Park Duisburg-Nord, Neue Mitte Oberhausen, Phönix Dortmund, morphological and functional changes, urban morphology

1. Introduction

Revitalization is a sequence of planned actions aimed at social and economic recovery of the degraded part of the town. It includes comprehensive changes in spatial, functional, urban, infrastructural, social and environmental structure of the urban space. It is a particularly complex, long-lasting and interdisciplinary process, in which numerous organizations and institutions are actively involved (KACZMAREK, 2001; HELLER, 2002; STAWASZ & SIKORA, 2007; LORENS, 2010; KOPEĆ, 2010). The notion of 'revitalization' refers to actions conducted on the existing urban areas which, for various reasons, have been degraded (BEHR ET AL., 2003). Considering the initial use of the urban space, degraded urban areas can be divided into four groups: 1) housing areas, 2) multifunctional complexes, 3) areas with

technical and industrial infrastructure and 4) urban wastelands (LORENS, 2010).

A special type of degraded urban spaces are brownfield sites. According to LORENS'S (2010) division brownfield sites are included in the third group – the areas with technical and industrial infrastructure. Characteristic features of this group are: the loss of hitherto function and the exclusion from use, and also the lack of permanent inhabitants. The success of the revitalization of such areas is dependent on external factors, in particular the spatial accessibility, and internal factors such as size of the area and the type of buildings (GASIDŁO, 1998; DOMAŃSKI, 2000). The advantages of brownfield sites are their proximity to the city centre and the transport infrastructure (BEHR ET AL., 2003). However, the environmental pollution, infrastructural barriers and ownership barriers

may make it difficult to re-use former industrial areas (JARCZEWSKI, 2010).

Because of the specific circumstances outlined above, the revitalization of brownfield sites is particularly complicated. It is often associated with regeneration (restoring value through renovation or modernization) of historical buildings or technological monuments, it frequently requires expensive liquidation of industrial installations and purification of the environment from pollution (land reclamation), but mainly it is related to the introduction of new functions and communities into these areas (DOMAŃSKI, 2010; LORENS, 2010).

This paper shows the relationship between revitalization and evolution of the urban space, which is within the range of research interests of urban morphology. Evolution of the urban space is reflected in morphological and functional changes. Morphological changes refer to the transformation of physical elements of the town (which are buildings and their related open spaces, plots or lots, and streets) and changes in its layout (KOTER, 1994). In turn, functional changes are understood as succession of function or relocation of function (SŁODCZYK, 2003). It should be noted that in morphological studies the notion of function usually refers to the land and building utilization (SULIBORSKI, 2010).

Urban space is changed in a dynamic manner throughout the period of its formation, under the influence of variables and various factors. Every part of the town may evolve in another way and under the influence of another factor. For brownfield sites a perfect impact to evolve is revitalization. But every brownfield site may change in another way. So the aim of this paper is to consider how different may be the impact of revitalization on the evolution of similar urban areas, especially brownfield sites. It would be shown an example of three former iron and steel works areas located in the Ruhr region of Germany.

2. Study area

The Ruhr region is the biggest urban agglomeration in Germany previously famous for being one of the largest old-industrial regions in Europe and today known as a postmodern place for tourism, leisure and culture. It is located in the west part of Germany in the state North Rhine-Westphalia.

The industrial history started in the Ruhr area in the 14th century when coal was exploited on the surface for the first time. Initially coal was especially important and mainly used for

domestic fuel, but in the 18th century many forges changed their energy sources. They switched from wood to coal which increased the demand for this raw material. The first steel on the basis of coal was produced in the Ruhr area in 1826. Hence, an industrial landscape developed in the Ruhr area which consisted of coking plants, steelworks, ironworks, employee housing districts and factories. The consumption of land increased and simultaneously a rapid growth of the population occurred proportionally to the increase in production of coal and steel. This situation lasted even after the World War II (HOPPE ET AL., 2010; REGIONALVERBAND RUHR, 2006).

In 1960. in the Ruhr region there was a crisis of coal surplus, which was followed by a crisis in the steel industries in 1970. Coal mining and steel production were no longer commercially viable and many mines and foundries had to be closed down (FAUST, 1999; FARRENKOPF, 2009). It was the beginning of the revitalization of this region. The new strategy for the economic re-orientation of the Ruhr area was to change it into a region specializing in the service sector. The big step to solve the problems caused by the restructuring of industry like the unemployment or re-use of post-industrial space was the International Building Exhibition (IBA) Emscher Park 1989-1999. It was a program which was created to give an impulse for new ideas and projects for the future of the Northern Ruhr area – the Emscher river region. One of its main goals was to preserve and restore impressive landscapes and unique building examples of the industrial age as part of the heritage. The IBA was also supposed to provide impulses for questions regarding social integration and for the cultural consciousness in the Ruhr area (PARENT, 2005; WILLMS, 2005; WEHLING, 2006). As a result the Ruhr region, called recently “the Ruhr Metropolitan Area”, is nowadays a post-industrial region famous for its cultural events (i.e. Extraschicht) and tourist attractions (i.e. the Industrial Heritage Trail), which are strongly attached to its industrial history (CHMIELEWSKA, 2010a; OTTO & CHMIELEWSKA, 2012).

Duisburg, Dortmund and Oberhausen are three towns located in different parts of the Ruhr region, all famous previously for their industrial past especially iron and steel production, but representing different kinds of industrial towns. On the one hand, Duisburg and Dortmund are both old medieval towns, once members of the Hanseatic League, located on the trade trail which changed their character in 19th century by the influence of industrial revolution. Oberhausen on the other hand is a quite young town which

developed like a typical 19th –century industrial settlement and was awarded town rights in 1874.

The research area consists of three objects of study which are post-industrial sites developed by revitalization in place of former iron or steel works. The first object of study is the re-used ironworks in Meiderich in Duisburg known nowadays as the Landscape Park Duisburg-North. The second object of study is located in Oberhausen where in place of the steelworks Gute-Hoffnungshütte the shopping and entertainment centre Neue Mitte Oberhausen (New City Center of Oberhausen) was created. The third object of study is the area of former iron and steel works Phönix (previously named Hermann) in Hörde in Dortmund redeveloped in a multidirectional way by implementation of the Phönix Dortmund project.

3. Materials and methods

In the paper there were applied methods specific to urban morphology. For each object of study the comparative analysis of the town plan was carried out. Town plans from before and after the revitalization process were compared. Special attention was paid to the land use. Subsequently, historical sources (literature, photographs) were analyzed and revitalization programs described in literature and on the internet. The research was complemented by field observations. This allowed the observation of morphological and functional changes which occurred as a result of revitalization of the study areas.

4. Results

Results of the studies are presented separately for each case study according to the scheme: first some information about the past history of the place, then shortly about its revitalization, and finally the consequences of revitalization especially the morphological and functional changes of urban space. After that there is a brief comparison of the results.

4.1. The Landscape Park Duisburg-North

The first object of study, located in Meiderich – the district of Duisburg, covers the area of the re-used ironworks, which was one of the Thyssen's plants. The production of iron started there in 1901 and lasted intermittently until 1985. After the closure of the plant the demolition of its buildings was considered but the idea was discarded because of the costs. Revitalization of

the area started in 1991 by implementation of the concept designed by Peter Latz who wanted to emphasize the history of the place within the new utilization by creating a landscape park. As a designated recreational space, the park was supposed to increase the quality of life of the adjoining district, become a place for cultural events and at the same time also demonstrate the possibility to experience the heritage of the industrial past. Nowadays the Landscape Park represents a space for diverse user groups, it is a location for exhibitions, company celebrations, sports events and for family picnics on weekends etc., and thereby constitutes a multifunctional space. The Landscape Park Duisburg-Nord is also an important tourist attraction as it is a part of the Industrial Heritage Trail in the Ruhr area and the European Route of Industrial Heritage (more about this project in: OTTO & CHMIELEWSKA, 2012).

As a consequence of revitalization the urban space of the former ironworks in Meiderich has evolved. It might be noticed that due to the avoidance of liquidation of the buildings of the plant the morphology of the area is practically unchanged. Overgrown areas which are dominated by plants have been left as natural as possible. Old machines, pipes and bunkers produce a natural flair of decay. The decline of industry has not been forcefully concealed by expensive renovations, or by the construction of new buildings. There are only slight visible changes of particular objects which over the course of time were restored or adjusted to new purposes. Thanks to that the park offers an authentic industrial atmosphere.

Nevertheless, the revitalization definitely led to the change of function of this analysed urban space. The landscape park is known as a location for everyday sport, leisure and recreation, it is also a well-known tourist attraction, and a place where extraordinary events are organized. None of the post-industrial objects located in the landscape park has retained its previous industrial function. Several buildings (i.e. former power plant or former blower house complex) have been adjusted for rental as venues for events like parties, fairs, galas or exhibitions, and the former gasometer was turned into a diving centre. In addition there are many sports and recreational facilities located among the former industrial installations like: an open-air cinema, a playground, a climbing garden, beach badminton and beach volleyball courts, a surface for street soccer, a mountain bike course and a skate park. Even the blast furnace is available for visitors and at its top there is a panorama point.

4.2. Neue Mitte Oberhausen

The second object of study, located in Oberhausen, covers the area used by the steelworks complex Gute-Hoffnungs-Hütte for almost 200 years – from 1782 until 1979. Revitalization of this area started in 1988 with the concept called Neue Mitte Oberhausen (The New City Center of Oberhausen) which aimed to change the former industrial core of the city into a new city centre with a huge shopping mall and a lot of space for entertainment, leisure and recreation. The project was initially considered to be detrimental to the old city centres of Oberhausen and neighboring towns was finally approved in 1991. The construction of the shopping mall CentrO began in 1994 and its grand opening took place in 1996. Since then in the following years other facilities in the new city centre have been created: indoor gastronomy area Coca-Cola Oase and the externally oriented Gastronomic Promenade with over 20 thematic catering facilities, Multiplex Cinema, multifunctional event hall Arena Oberhausen (known also as Königs-Pilsner-Arena), exhibition hall in the Gasometer, Metronom Theater, amusement park CentrO Park, aquarium Sea Life Center, Yacht Marina by Rhine-Herne-Channel, Aqua Park, High Ropes Course, Industrial Museum, and recently other amusement parks: TOP SECRET, Abenteuer Antarktis and Legoland Discovery Centre. In addition, there are a few hotels, the Oberhausen Technological Center and two Environmental Institutes in the belt of post-industrial space surrounding the area of the new centre, in the near future a Business Centre will be also located there. Nowadays the New City Center of Oberhausen is one of the biggest Urban Entertainment Centers in Germany (more about the project in: [PROSSEK, 2004](#); [KRAJEWSKI ET AL., 2006](#); [WEHLING, 2006](#), www.centro.de).

The revitalization of the study area entailed the transformation of its urban space. The morphology of this place has almost completely changed. Buildings and installations left after the steelworks closure were liquidated. There are only a few post-industrial relicts left: the former casino and guest house, which are today part of the Oberhausen Technology Center, the 117 m high Gasometer (the highest in Europe), which since 1994 has been used as an exhibition hall and view point (this object wasn't at the beginning a part of the New City Center of Oberhausen but it became an icon of the city so therefore and thanks to the proximity to the CentrO became in 1998 a part, and a symbol of, the New City Center of Oberhausen), and the

Main Warehouse of the Gute-Hoffnungs-Hütte built in 1920., which became an industrial monument and was taken under the preservation in 1989, nowadays since 1998, it is part of the Industrial Museum as its central depot. Another trace of the past in morphology of the study area are transportation routes: roads and some railways, which, despite changes in the surrounding landscape, have preserved the same course as in industrial times, so the general layout of the study area hasn't changed.

Revitalization has also led to a change of functions of the urban space of former Gute-Hoffnungs steelworks. Industrial functions were replaced by widely understood service functions like: commercial functions, entertainment functions, recreational functions, cultural functions, tourism functions, etc., so the New City Center of Oberhausen is a multifunctional complex.

4.3. Phönix Dortmund

The third object of study, located in Hörde – the district of Dortmund, covers the area used by the foundry Phönix (previously Hermann) since 1841 for 160 years. From the beginning this area has been divided into two parts which used to be specialized in other fields of metallurgy: in the western part the pig iron was produced so the blast furnaces were localized there, and in the eastern part iron and steel were processed so it was the location of rolling mills, puddling furnaces and forges. These two parts have been separated from each other by the historical centre of Hörde, but a kind of connection between them has been the river Emscher. Revitalization of this study area started shortly after the end of production: in 1998 in the western part and in 2001 in the eastern part. This process is carried out mainly by implementation of a complex project Phönix Dortmund divided into 5 independent ventures as well as two complementary projects focused on the restoration of the Emscher river valley (more about these projects in: [CHMIELEWSKA, 2012](#)).

As a result of a comprehensive and multi-directional revitalization the area of the former Phönix iron and steel works is undergoing a metamorphosis and a qualitative new space has been created there. It might be noticed changes in both landscape and morphology of this part of Dortmund, as well as changes of functions of each part of its space. Former industrial sites are changed into: industrial objects of a highly specialized sector, recreational and leisure facilities, residential areas, service areas (also including

cultural and gastronomic facilities), and areas of natural value.

The ongoing morphological and functional transformation of urban space is heterogeneous. The division of the study area into western and eastern parts is nowadays even more visible than in the past, and the differences between them are a consequence of different concepts for the re-use of these areas.

During the revitalization of the eastern part (called Phönix Ost) a completely new urban space has been created from scratch. The morphology of the area has been entirely converted – the space previously occupied by the foundry was taken over by multifunctional usages: residential, service and leisure complex, with an artificial water reservoir in the middle. There is not a single post-industrial building remaining in the area, also the layout is completely altered. The urban space of Phönix Ost has also changed its function as a result of revitalization, namely its industrial functions have been replaced by widely understood and diverse service functions. Actually, the only remnant of the industrial past of this area is a Thomas converter (the device used in the process of steel production) placed on the island in the western part of the reservoir as a kind of monument.

The revitalization of the western part of the study area (Phönix West) also resulted in morphological changes, but not as visible as in the eastern part. Among the new buildings there are several post-industrial buildings (even the blast furnace) preserved and these are adapted to the current purposes. However, the redevelopment has not led to a change of function in this part of the study area. In its urban space industrial functions still dominate, but they are represented by completely different branches of industries than metallurgy, namely the innovative industries like: high-tech industries, medical and pharmaceutical industries, chemical industries, energy industries etc.

As a result of revitalization the urban space of the former iron and steel works in the Ruhr area gained a new look and new functions. In spite of similarities among the three objects of consideration they were changed in completely different directions: one was transformed into a landscape park, another evolve into a shopping and entertainment centre, and the third was changed partly into an innovative industrial complex and partly into a multifunctional one: residential, service and leisure complex. So in all these objects there occurred the succession of function, but in different directions.

And how is the morphology of their urban space? The morphology of the first object is practically unchanged, the morphology of the second one, on the contrary, is almost completely redeveloped. In the case of the third object – its morphology has changed but heterogeneously: the east part is entirely transformed and in the west part there are many preserved post-industrial objects.

5. Discussion

The Ruhr area is a region where revitalization has a long tradition. The three objects of study aren't the only revitalized post-industrial places there, even the directions of their revitalization aren't one of a kind. There are other landscape parks located in post-industrial space, like: Nordstern Park in Gelsenkirchen, Hoheward Park in Herten or Maximilian Park in Hamm. There are also other multifunctional complexes, i.e.: The Zollverein World Heritage Site in Essen, Duisburg Inner Harbor or Neue Eving in Dortmund. There are finally other innovative industrial objects built in place of traditional industrial plants, for example: Chemical Industry Estate in Marl or Technology Park in Mülheim (CHMIELEWSKA, 2010a,b). Nevertheless, these three case studies are among the largest revitalization projects in the Ruhr region and they may be classified as so called „Grand Projects“ (ZLONICKY, 2009).

Continuing the discussion about the directions of revitalization it might be noticed that nowadays it is quite popular to arrange space using the “element of water” like in Phönix Dortmund. It is only not popular to create a new water reservoir from scratch. Mostly there are already existing lakes or reservoirs or the excavation pit mines are flooded, like ponds Pogoria I, II and III in Dąbrowa Górnicza (Poland) or a complex of ponds Szopienice-Borki in Katowice (Poland) which are used for leisure and recreation and are also sites of natural protection (CHMIELEWSKA, 2010c). It is worth noting that in Germany it is popular to revitalize old harbors, into the most interesting projects may be included: the redevelopment of harbors along the Rhine: Rheinauhafen in Köln, Medienhafen in Düsseldorf and Innenhafen in Duisburg, and two other big projects: Hafen City in Hamburg and Westhafen in Frankfurt am Main (ZLONICKY, 2009). There are also revitalized smaller harbors along channels in the Ruhr area like in Bergkamen, Lünen or in Dortmund (DICKMANN & DIEKMANN-BOUBAKER, 2008).

Another issue is the revitalization of former iron and steel works in other post-industrial regions. In Poland there might be outlined 3 directions of revitalization of such types of space: 1) establishment of an Investment Park called "Special Economic Zone" like i.e.: in place of Stalowa Wola steelworks in Lubaczów and Stalowa Wola, or in place of Ostrowiec steelworks in Ostrowiec Świętokrzyski; 2) creation of a Technology Park or Industrial Park for example: KGHM Letia Legnica Technology Park, Industrial Park in Piekary Śląskie, Upper-Silesian Industrial Park in Katowice and Częstochowski Industrial Park; 3) redevelopment as a Shopping Center in place of ironworks in: Zabrze (SC Platan), Gliwice (SC Focus Park) or Dąbrowa Górnicza (SC Pogoria). Single post-industrial buildings may be adapted to the housing function, especially converted into a loft like in Bytom the baths of Mining and Metallurgy Factories Orzeł Biały, or they may gain a cultural function like the head office of Klemens ironworks in Ustroń changed into an art gallery and museum (HUCULAK, 2009). In all these cases the revitalization leads to the evolution of space, especially in a morphological way (it is quite rare in Poland to adapt an existing building for new purposes) and also in a functional way (however, opposite to Germany, in Poland much more frequently the space maintains its industrial function and changes only the industrial branch).

6. Conclusions

The aim of the paper was to consider the extent of the impact of revitalization on the evolution of post-industrial sites, which manifests itself in morphological and functional changes of urban space. Research was performed with the use of methods specific to urban morphology on three former iron and steel works areas located in Dortmund, Duisburg and Oberhausen in the Ruhr area of Germany, previously the largest old-industrial region in Europe. For each object of study a comparative analysis of the town plan was carried out. The town plans were compared before and after the revitalization process and special attention was paid to the land use. This allowed us to observe morphological and functional changes which occurred as a result of the revitalization of these study areas.

After comparing the results of this research for the three objects of study it was established that they all gained a new look and new functions as a consequence of revitalization. In spite of similarities among the three former iron and steel works areas they were changed in completely

different directions: the one in Duisburg was transformed into a landscape park, the one in Oberhausen evolve into a shopping and entertainment center, and the one in Dortmund was changed partly into an innovative industrial complex and partly into a multifunctional area: residential, service and leisure complex. So in all these objects there occurred a succession of function, but in different directions. Differences were also noticed among morphological changes of each object of study. The morphology of the object in Duisburg is practically unchanged, on the contrary the morphology of the object in Oberhausen is almost completely redeveloped. In the case of the object located in Dortmund – its morphology has changed but heterogeneously: the east part is entirely transformed and in the west part there are many preserved post-industrial objects.

The comparison of the results of these studies with other revitalization programs implemented in the Ruhr area and other parts of Germany, and also in Poland, showed many similarities and many differences between them, but it was ascertained that they all led to the evolution of urban space by inducing morphological and functional changes. However, it was noticed that in Poland – opposite to Germany – much more frequently the urban space maintains its industrial function and changed only the industrial branch.

In conclusion, the performed research showed that the revitalization of post-industrial space may be conducted in many different directions but irrespective of that it has a huge impact on the evolution of urban space both in a morphological and a functional way. The extent to which revitalization affects the morphological and functional structure of the urban space depends on the plan for the future spatial development of the site and the attitude to its post-industrial heritage.

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