

## European Industrial Agglomerations: Metropolitan Urban Landscapes?

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### Summary

#### Introduction

This keynote lecture aims to link the past and future development of large European industrial agglomerations with the global urbanisation of the approaching decades. My main experience in this context is in the Rhenish-Westfalian industrial area known as "The Ruhr" in English, "La Ruhr" in French.

The development of European agglomerations from the 18<sup>th</sup> century onwards was ahead of that of agglomerations in other parts of the world, in terms of both population growth and economic growth. However, since the end of the 1950s the European **industrial** agglomerations have undergone a multifaceted process of change, whereby for several decades population growth in other areas of the world has been significantly higher than in Europe. The reasons for these processes of change are related to technology and economic structure. In the European industrial agglomerations planning approaches have thus emerged that aim to **design and develop an urban landscape able to fulfil metropolitan functions**. This urban spatial restructuring is a precondition for the generation of metropolitan functions. I would like to present these relations in six points:

- (1) Global urbanisation
- (2) Development of large European industrial agglomerations from the 18<sup>th</sup> to the 21<sup>st</sup> century
- (3) Definition of metropolitan functions
- (4) Urban spatial planning concepts for the industrial agglomeration of the Ruhr
- (5) The generation of metropolitan functions in the Ruhr to date and in the future
- (6) The significance of the development of old European industrial agglomerations for European and global urbanisation

#### (1) Global urbanisation

Since 2008, the majority of human-beings live in cities. The global level of urbanisation has reached 50%. A 70% level of urbanisation is predicted for the year 2050.

The key reason for this rapid urbanisation is the increase in the world population. In 2010 the United Nations Population Fund predicted a rise from 6.9 billion people in 2010 to over 9 billion by 2050. Population density of the earth will increase from the 50 inhabitants per square metre that we have today, to almost 70. Ways of life involving denser and thus more urban forms of coexistence will become unavoidable. However, increases in population vary between the more and less developed regions of the world: Africa can expect an increase from 1033.0 million to 1998.5 million, i.e. population figures will almost double; Asia is to increase from 4166.7

million to 5231.5 million; Latin America from 588.6 million to 792.2 million; North America from 351.7 million to 448.5 million. In contrast, predictions for Europe, including Russia, indicate a decline from 732.8 million to 691.1 million.

Reasons for these variations that can be captured in figures are life expectancy and birthrates per woman. Historical explanations refer to technological progress since the Enlightenment that, first in Europe, led to:

- Industrialisation
- Migration from agricultural regions to urban agglomerations
- The development of life-extending medical knowledge and its application

- The erosion of traditional social structures and the evolution of social welfare state systems, which integrate societies.

In highly developed societies life expectancy had reached 80 years of age by the end of the 20<sup>th</sup> century and birthrates per woman were well under two children. These factors brought further population growth to an end. The growth of European agglomerations has also been affected by the widespread *decline* of the agrarian sector in Europe, which has brought to an end the traditional internal migration from countryside to cities. Agglomerations in Europe can thus only maintain or increase their population figures through migration from agricultural areas in other parts of the world. In non-European regions of the world the population continues to grow – until here too European levels of life expectancy and birthrates are achieved. Agglomerations in these areas of the world will continue to grow as long as population-rich agricultural structures exist. These predictions are likely to be fulfilled. Uncertainty surrounds the development of cross-border migrations that could lead to additional population growth in individual agglomerations, also in Europe. An understanding of these demographic relationships is, however, largely lacking in Europe.

## (2) Development of large European industrial agglomerations from the 18<sup>th</sup> to the 21<sup>st</sup> century

A global viewpoint of European agglomerations from this perspective concentrates largely on the past. The key question is: what were the reasons underlying the head start in development seen in Europe since the 18<sup>th</sup> century? The answer is: industry. Even today more developed states are known as industrial countries, although this contradicts recent sectoral change towards service and knowledge economies. The contradiction becomes particularly obvious when old industrial agglomerations are analysed as problem cases. This then begs the questions: What differentiates industrial agglomerations from other agglomerations in Europe? And what are the challenges linked to them, both for Europe and for other world regions, often called developing countries?

All the large European agglomerations developed in the course of industrialisation from the 18<sup>th</sup> century onwards. But this development took two different urban spatial forms. One of these can be traced back to the **European** city of the Middle Ages and early modern times. The other first came into being in the course of industrialisation. Although all large European cities were affected by industrialisation, the surviving distinction is whether industry **attached** itself to existing urban structures or **overlaid** smaller villages and towns. Before industrialisation large European cities were **architecturally** significant **capital cities** with **central** political and cultural functions, or port-towns with central economic functions. **Industrial areas agglomerations on coal deposits** developed **without municipal planning** and **without a guiding cultural concept**. The economic-technological rationality underlying the development of these settlements was provided by coal extraction and the burning of coal in large steam engines to produce steel. The decision functions of enterprises usually remained elsewhere. To speak of metropolitan functions is to use a term that from an economic historical perspective is connected to sectoral change to a service and knowledge based economy. When the term is applied to this past context, however, it becomes clear that metropolitan functions were almost completely lacking in these industrial agglomerations.

The largest urban agglomerations of Europe:

**on the one hand** London, Paris, Istanbul and Moscow, cities that with over 10 million residents have an unassailable lead in terms of population, but also Berlin, Madrid, St Petersburg, Barcelona and Ankara with around five million residents;

**and on the other hand** the agglomerations of the Ruhr and of Upper Silesia or the Kattowice Voivodeship;

have thus over time been influenced by different economic and spatial developments.

In the industrial agglomerations industry overlaid and changed settlement landscapes that had been comparable to others in central Europe. Thus in the Ruhr there were 450 castles, palaces and stately homes. The basis for the development of the agglomerations was coal extraction, while the development of widespread densification was caused by the construction of coke-powered steel works. **The Ruhr and Upper Silesia emerged as agglomerations with millions of inhabitants only within the spatial interconnections of the coal and steel industry**. Coal deposits also exist in other areas of Europe: in the Saarland and the district of Aachen, in Wallonia, in Spain and especially in Great Britain. In the latter case the coal and steel industry developed earlier, but coal deposits are more regionally dispersed and economic diversification in the large agglomerations was broader owing to industrial developments pre-dating the steam engine. In addition, the all-encompassing centrality of London prevented the development of other million-strong agglomerations. Ore-mining areas such as

the Siegerland, Luxemburg or Lorraine required coal to be transported to their steelworks and remained smaller. The introduction of electric steel-making plants marked the end of the development of agglomerations based on the coal and steel industry.

The development of the industrial agglomerations of the Ruhr and Upper Silesia occurred almost in parallel, although Upper Silesia, where ore mining had occurred since the Middle Ages, was somewhat ahead: here the first furnace was built in 1796, in the Ruhr it was ten years later. The parallels continue today. Within the borders of the Ruhr Regional Association are 5.2 million inhabitants on 4435 km<sup>2</sup> with a population density of 1200; while Upper Silesia within the borders of the Silesian Voivodeship has 4.6 million inhabitants on 12,300 km<sup>2</sup>, a clearly larger area and therefore significantly less densely settled with 381 inhabitants per km<sup>2</sup>. Fourteen cities founded the Upper Silesian Metropolitan Association in 2007; about 2 million inhabitants live here. Parallels can also be found in urban spatial development concepts, as shown by the Silesian Voivodeship's development strategies for the period 2000-2020 from the year 2005. An industrial heritage trail with 31 attractions has existed since 2006.

The economic advantages of these industrial agglomerations came to an end with the decline of the coal and steel industry. This occurred in North America even before World War Two. In Germany and in other parts of Europe such developments were overlaid by the Second World War, the destruction of many cities, and the flight and expulsion of significant quantities of the population. Dortmund, part of the Ruhr industrial agglomeration, suffered the most destruction of all German cities: the bombing raids targeted the coal and steel plants. The economic decline of coal mining and the steel industry thus did not begin in Germany until the end of the 1950s. In Upper Silesia it contributed to the implosion of communism in 1989, before the coal and steel industry was drawn into the centrally planned economy -the largest ironworks in Poland was built in Kattowice after 1970-. In the coal and steel industry over 320 000 jobs were then lost here.

The technological driver for this historic economic change was the replacement of the steam engine, that had led to the **maximisation of production processes and sites**, by the computer, that made **minimisation** possible. As a result, the **functional** and **urban design** deficits of the industrial agglomerations became obvious. The functional deficits were more clearly formulated, as for ten years cities and urban regions had been expected to possess metropolitan functions of global or at least European dimensions.

### **(3) Definition of metropolitan functions**

Metropolises can be measured according to their metropolitan functions, particularly in terms of their social spatial significance. As Hans Heinrich Blotevogel points out, metropolitan functions are: **decision and control functions** for businesses, state and supra-state institutions; **innovation and competitive functions** in economic, technical and social-cultural areas; **gateway functions** involving access of and to people, knowledge and markets; and **symbolic functions** such as culture in theatres, museums and art; media; events; architecture; urban design and image.

This description of metropolitan functions corresponds to the socio-economic conditions of post-industrial service and knowledge societies. One question is, whether and under what circumstances metropolitan decision and control functions have been or are held by large companies, originated as coal and steel producers that in the course of economic development established their headquarters in industrial agglomerations. This is indeed the case for Krupp from the 19<sup>th</sup> century and also for Krupp-Thyssen from 2010.

### **(4) Urban spatial planning concepts for the industrial agglomeration of the Ruhr.**

The economic decline of coal mining and the steel industry was only slowly understood and politically accepted. However, an epochal decision was made with the founding of the Ruhr University of Bochum in 1965. The fundamental barrier to development in the industrial agglomeration was broken down. Access to knowledge through studying and research emerged and it became possible to develop scientific innovations in the agglomeration. Before the university was founded, there were only 4000 students in the agglomeration, at the college of education in Dortmund, today there are 140,000. At the time of the decision there was no thought of metropolitan image, the intention was rather to even out a blatant disadvantage, but 30 years later the existence of the university created conditions under which metropolitanism could be spoken of.

The parallels to Upper Silesia are clearly recognisable. Here too there was no university but only a college of education until the end of the Second World War. It was though earlier, in 1945, that Poland founded the Silesian Technical University in Gliwice. The founding of the Silesian University in Kattowice followed in 1968, three years after the founding of the Ruhr University.

The **Ruhr Development Programme**, passed by the state government of North Rhine Westphalia in 1968, had a long-term effect on the restructuring of the industrial agglomeration. It was an initial **urban spatial planning concept** for the agglomeration with concrete projects for the densification of the urban cores, the road and rail transport infrastructure, the further construction of colleges and universities, and investments in the environment – such as the improvement of the Emscher system, the disposal of waste water in an open sewer. The Emscher, a 70-kilometre-long tributary of the Rhine, became an open sewer in the course of industrialisation. Re-naturalisation of the Emscher and its tributaries has already been initiated by the **Ruhr Development Programme** and now constitutes the most important project related to restructuring of cultural landscape and ecology in the Ruhr. Construction is to continue until 2020 with total costs of 4 billion €.

25 years later it was possible to recognise the urban design opportunities created by the decline in importance of coal and steel.

First of all, **industrial buildings** started to be perceived as monuments influencing urban culture: the **coal mine Zollverein in Essen** has in the meantime become a world heritage site.

**Abandoned industrial areas are finding new functions:** they were no longer needed by heavy industry because of changes in technology.

**Public spaces have been created** from areas that were previously “forbidden” space because of the presence of industrial plants.

The International Building Exhibition Emscherpark held between 1989 and 1999 created the preconditions for *urban design*. In this context Thomas Sieverts formulated the theoretical basis for the urban spatial design of industrial agglomerations.

It is possible to generalise about the new perspectives. There are urban design opportunities for urban development that are appropriate to the conditions in which industrial agglomerations emerged. These differ from the challenges faced by reconstructed European cities. The Ruhr agglomeration has, indeed, a perhaps surprising advantage over such cities: **in the Ruhr there was no suburbanisation process.**

From the largely unplanned and certainly non-integrated urban spatial development of the Ruhr it is now possible to develop a distinct concept: **An urban landscape or cityscape with settlement nodes of varying density and with variously divided and bundled functions is to be designed.** The **paths** connecting these settlement nodes are **parks and green corridors**, if they not contain functional transport infrastructure. Robert Schmidt's regional green corridors running north-south and the Emscher Landscape Park, the Ruhr Valley in the south and the Lippe floodplain in the north, are thus linked to form a **basic cultural landscape network** that can be **more tightly meshed.**

The settlement nodes can then be densified and functionally strengthened. Corresponding urban spatial planning concepts can, however, only be realised with continued economic growth. Population growth remains an open question. Cities were created by the migration of “stupid farmers” from the countryside, as Max Weber recognised. In the 19<sup>th</sup> century they came to the industrial agglomeration of the Ruhr from Poland and Masuria and developed here innovation capabilities, now they come from Turkey.

The notion of settlement nodes of varying density and with variously divided and bundled functions suggests polycentrism, correctly. Polycentrism and metropolitan functions are also seen as contradictory, incorrectly. The new universities in Bochum, Dortmund and Duisburg were not built in the centres of these cities; rather they made the development of new centres possible. Industrial monuments and the new open spaces created on abandoned industrial sites are mostly found beyond the “inner cities”. New centres have thus developed: centres that do not correspond with the metropolitan centrality of reconstructed European cities. It thus becomes clear that the development of polycentrism in agglomerations is a process of emerging metropolitan functionality. The spatial planning concept of metropolitan regions with its decentralised division of functions takes this into account. In the Ruhr agglomeration dealing with polycentrism can, however, be problematic if it justifies the difficulties related to integration-facilitating decision-making. The number of centres in the Ruhr is not equivalent to the number of independent municipalities in the area of the Ruhr Regional Association – 11 non-district and 42 within district authorities. In particular, the larger municipalities were not formed by a process of historical growth but result from the, at times somewhat arbitrary, incorporations and municipal territorial reforms of the 1920s and 1970s.

The development of polycentrism in the Ruhr indicates a gain in metropolitan functionality that crosses municipal boundaries.

### **(5) The generation of metropolitan functions in the Ruhr to date and in the future**

How has the Ruhr gained metropolitan prestige within the framework of this **urban spatial planning concept and its implementation to date**? How can this status be further improved? The answer is structured around Blotevogel's definition.

#### **1. Decision and control function**

Clearly the Ruhr possesses no state or supra-state institutional decision and control functions. This is the result of political decisions made at the time of the German Empire and the Weimar Republic, as well as in North Rhine Westphalia and the Federal Republic of Germany. The Ruhr is controlled from the outside and decisions are taken elsewhere, leading to a confusing fragmentation of this function. Up to the present time, the municipalities have problems in even winning powers of integrated decision-making and control for this function. Nonetheless, a level of sovereignty appropriate to a population of five million is a necessary precondition for the Ruhr to be able to possess metropolitan decision and control functions. The situation as regards decision functions in business is rather different. In the course of the structural changes that took place initially within the industrial sector and then leading towards a service and knowledge economy, company headquarters have located in the Ruhr. These are not limited to Krupp, but also include, in particular, RWE from the energy sector and trading companies.

#### **2. Innovation and competitive function**

Until the 1960s innovative impulses for the enterprises also came from outside the Ruhr: the Institute of Technology of North Rhine-Westphalia in Aachen was particularly important for technological innovations. The founding of the universities in Bochum, Dortmund, Essen, Duisburg and Hagen after 1965 radically changed the situation as concerns fulfilling the innovation and competitive function in the economic-technical and socio-cultural spheres. These universities are still dealing with the backlogged need for academic qualifications that had built up among students in the agglomeration, as can be seen in the field of research, particularly in terms of competing with Munich. Nonetheless, the neglect of the Ruhr by the federal authorities has continued in this area. Per resident, the Ruhr received the second lowest amount of federal funding for research and higher education between 1996 and 2006 in all Germany; only Bielefeld came off worse. The federal average was around €500, the Ruhr received €250, Munich though received €1350 and Berlin €1000.

The further development of metropolitan functions is thus critically dependent on the strengthening of the innovation function. In terms of federal responsibility, this task falls within the remit of creating spatially equitable living conditions in Germany. The strengthening of innovation functions is directly connected with the decision and control functions of enterprises.

#### **3. Gateway function**

Access to and from **knowledge** is one of the gateway functions. The founding of the universities opened up this gateway.

The strong export orientation of large enterprises in the Ruhr ensured that the gateway function of access to **markets** was already in existence. This function can be improved in metropolitan terms in conjunction with innovative ability.

For cities in general and for the emergence of large agglomerations, access for **people** refers particularly to migration from the countryside, thus Max Weber's definition of the city. Global population trends have largely ended migration from within Europe, one historically unprecedented consequence of which could be metropolises with no population growth. Also possible is migration from agricultural regions of other parts of the world. The migration of the more qualified is preferred, although this strategy contributes to the prolonging of unequal global development. A contrary strategy would be to export the urban metropolitan landscape into the global urbanisation process; to export the experience that shows that agglomerations can correct the urban planning deficits of the past and avoid them in the future.

#### **4. Symbolic functions**

Gateway functions and symbolic functions are closely connected to one another. Access for people refers also to those who enter the agglomeration temporarily, drawn in by the attractive symbol of a metropolis, in this case the urban metropolitan landscape. The Ruhr has gained this attractiveness in the last ten years due to the distinctive design of its urban landscape. Examples include the landmarks

on spoil tips, the monumental ex-industrial sites such as the world heritage site of the Zollverein, the Emscher Landscape Park, the newly created open spaces occupied by objects of art. Is that urban enough? If cities are houses with people living in close proximity to one another, then it is, because such residential areas are found all over this designed landscape. And among them are important architectural works not just from the age of industrialisation, but also Romanesque and Gothic churches, Renaissance palaces, the historical town of Hattingen, the historical village of Westerholt, and the 450 or so castles, palaces and *stately homes* that can be found in the Ruhr. In addition, there is the remarkable architecture of the 19<sup>th</sup> and 20<sup>th</sup> centuries, particularly the Garden City developments of workers' housing. These buildings and the industrial buildings form built culture that has a cultural identity recognisable to others. They are the basis of an urban landscape that has only come into its own through the cultural creativity of the present time. There have been theatres and museums in the Ruhr cities for a long time, some of them with excellent track records. Artistic directors at the Schauspielhaus Bochum include Peter Zadek, Klaus Peymann and Mathias Hartman; while those of the Ruhrtriennale, an arts and music festival established in 2002, include Gerard Mortier, Jürgen Flimm and Willy Decker. Living culture as it emerges within an identity-orientated urbanity has now been displayed by the Ruhr in its role as the European Cultural Capital of 2010, well beyond the area of the Ruhr itself. This is perpetuated by the new Ruhr Museum designed by Rem Koolhaas at Zollverein, the new Folkwang Museum by the architect David Chipperfield, and new cultural centres like the U in Dortmund. And its continuation is ensured by events where around 2 million people take to the central East-West A40 motorway on a Sunday. The term identity has been mentioned. The identity of the Ruhr is changing in the course of this process of developing metropolitan functionality. The past, a past that was not particularly humane and that will not return, is being left behind, but through interaction with remembered and still experienceable history a new creativity is being developed.

The Ruhr thus possesses the innovation function, and also the gateway and symbolic function. From an economic perspective, the latter are also termed soft location factors. Their economic value depends on whether economic developments are positive. Economic growth in more developed countries is based on technological innovations and increased productivity. Descriptions of technological change that also leads to increasing proportions of services and knowledge and to decreasing proportions of production in GNP are more useful for determining this than traditional sectoral divisions between agriculture, industry, services and the knowledge economy. The identity-orientated term **industrial location** can thus sound rather backward-looking and lessen gains made in metropolitan image. Locations with economic enterprises that under conditions of growing GNP contribute to increased employment, rising incomes and an increased taxation and duties base are attractive **economic locations**. The Ruhr is competing here with other metropolises and metropolitan regions, but since 2010 with better prerequisites than twenty years ago.

## **(6) The significance of the development of European industrial agglomerations for European and global urbanisation**

What contribution is made to the European and global urbanisation process by the development of the Ruhr to an urban metropolitan landscape?

First, it gains in competitiveness along with other agglomerations in Europe and globally. Like all market-driven economic activities, this competitiveness has a demand and a supply side. Europe continues to profit from its developmental head-start, as shown in the continual technological innovations that can have the general effect of encouraging export, also for the Ruhr. More specific contributions arise out of the character of the Ruhr agglomeration. Agglomerations outside of Europe are mostly much larger and can expect a great increase in population by 2050. They can learn expertise from the spatial design experience of the Ruhr, as appropriate to their individual social-economic conditions. It would be an error of perception to believe that the agglomerations of this world are waiting to adopt the model of reconstructed European cities. The Global Report on Human Settlement 2009, "Planning Sustainable Cities" by UNHABITAT, is informative in this context. Such a notion remains connected to colonialism, compulsory imports and economically imposed projects. Architects from other parts of the world are also able to build, some of them do so in Europe. What is needed is the technical application of ecological insights. Over two billion people suffer because of inadequately treated wastewater, most of them in agglomerations. The revitalisation of the Emscher can be instructive in this context. *Innovations* in urban spatial development that are culturally symbolised in a newly designed metropolitan urban landscape can be an important export to contribute to the process of global urbanisation.

In Europe there are also possibilities for the export of the spatial design experience of the Ruhr, even if these are somewhat limited and require modification. Thus the creation of urban landscape is also

possible in the abandoned industrial districts of reconstructed European cities; unordered suburbanisation processes can thus be repaired. As for the technologically ambitious techniques used in the Ruhr, for instance for the Emscher revitalisation, they are easier to finance in Europe than in other areas of the world.

### **Conclusion**

My deliberations are influenced by the belief that, in Europe and globally, all people have the same right to good living conditions. I have tried to show both that this is possible, and how it is possible. Displaying deficiencies and accepting inequalities is often easier.