

TACKLING URBAN SPRAWL – A GLOBAL CHALLENGE FOR CARTOGRAPHY

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Abstract

Despite the demographic change and the not seldom stagnating economic situation the growth of settlement and traffic areas is, not only in Germany but also in other Western countries, alarmingly high. In order to answer questions on the sustainability of the urban development in European city regions land use data of the cities of Bilbao, Bratislava, Copenhagen, Dresden, Lyon, Munich, Oporto, and Palermo was exemplarily chosen for sophisticated GIS analyses. The investigations shed light on e.g. the development of the degree of soil sealing, the provision of public recreational areas, the integration of new settlements into the existing urban area, as well as the settlement density.

The final step – the presentation of the research results – is now forming a challenging issue not only for cartographers but also for scientists of several other disciplines since the causes, i.e. the driving forces, as well as the effects of urban sprawl are a complex field of research. Cartography – as an inter- and transdisciplinary science – could perfectly act as an intermediary between the different scientific branches and social actors dealing with urban development and in particular urban sprawl.

Key words: Urban Sprawl, Cartography, Interdisciplinary Research

1. INTRODUCTION

Urban sprawl, being associated with intensive land consumption and a topic often discussed among experts, is determined by a very complex agglomeration of political and socio-economic factors yielding in an even more multifaceted construct of social (also cultural), ecological and economic effects. Most advanced studies on urban sprawl have been carried out in the United States where disperse settlement structures are almost omnipresent. Nevertheless, the developments in European countries are alarming and similar tendencies as in the United States have been latently visible for years. In Germany for instance, every day 131 ha of open space were used for new-built settlement areas in 2004.

2. DEVELOPMENT OF LAND USE IN EUROPEAN CITIES - THE PROJECT MOLAND

2.1. Methodology

In order to answer questions on the sustainability of the urban development land use data of the cities of Bilbao, Bratislava, Copenhagen, Dresden, Lyon, Munich, Oporto, and Palermo taken from the EU-project MOLAND (Monitoring Land Use/Cover Dynamics, EEA 2002), recorded to a scale of 1 : 25,000 at four time slots during the past 50 years (mid-50s, late 60s, mid-80s, and late 90s) and underpinned by a finely nuanced use-type catalogue (extended CORINE legend), was exemplarily chosen for sophisticated GIS analyses.

The approach of the project MOLAND aims at revealing urbanisation trends which cannot be recorded by administrative statistics only. In order to differentiate the developments in the core zone (conglomerated settlement area) from those in the buffer zone (surrounding area) the calculations for each region were carried out separately (e.g. see Fig. 1). The core zone itself consists of all contiguous settlement areas recorded in the data base of the reference survey slot (1997/98). On that basis the buffer zone was calculated. Both, core and buffer zone, taken together build the entire city area. In none of the cases the core zone is not equal to the area defined by the administrative city boundary. Since for the city of Lyon no core demarcation line had been delivered investigations could be carried out solely for the entire city area.

2.2. Analyses and Results

The development of soil sealing within the eight European study cities revealed some commonness (see Figure 1). The sealed areas, used for residential purposes, industry, commerce, and traffic, saw a steady increase at the expenses of agriculturally used land, forests and semi-natural areas within the past 50 years. A decelerated development of this process was visible within the last survey period starting from the middle of the 1980s. The analyses also revealed that the growth of settlements took place strongly in the surrounding zones although there were still potentials – albeit to a different extent – for a densification in the cities' core zones [Meinel & Winkler 2003].

Beside the area analyses the presentation, quantification and assessment of the spatial pattern of the urban development are of great importance for an ecological evaluation. Furthermore, the demographic condition,

cultural influences as well as the topographic situation have to be integrated in a holistic and sophisticated evaluation of the settlement processes in order to assist a sustainable urban development which respects natural and societal conditions.

2.3. Presentation of the Results

The continued consumption of land and the therewith related problems are still insufficiently reflected in the society. Easy-to-understand dynamic and interactive presentations of the creepingly ongoing land use development could improve the perception of the problem. Therefore different methodological modules and results of the studies of the IOER research project "Long-term Surveys of Land Use Changes and Their Environmental Effects on Soil and Landscape Structure" have been prepared for the internet (www.ioer.de/langzeitmonitoring), and may inform politicians as well as city planners, scientists, and people who are interested in this very topic.

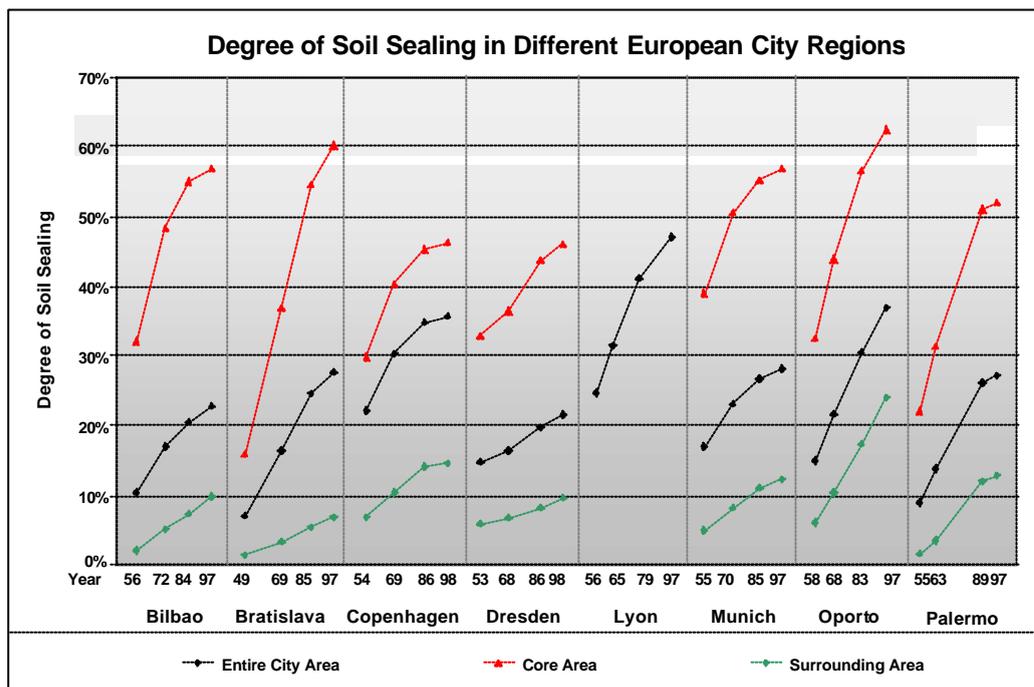


Figure 1: Development of the degree of soil sealing for core, surrounding and entire city area (for Lyon no demarcation line of the core zone was delivered).

3. NEW CHALLENGES FOR CARTOGRAPHY

However, passive methods to approach people such as internet presentations and scientific publications have the decisive disadvantage that a person finds the webpage or the publication only by her or his interest in the topic or "by co-incidence". In the latter case it is not very likely that the person is open and enthusiastic enough to understand the whole problem of land consumption or urban sprawl with its complex background. It is even less likely that she or he would find answers how to do something by her- or himself for a change. Therefore new or different approaches have to be investigated.

3.1. Who are the Target Groups?

In order to present the results in an adequate and effective way it is of great importance to know first of all who the group of people will be that is aimed to be approached. For many years scientists – in particular in Germany – have provided knowledge for the ease of (urban) planning processes and political decision-making. But, for more than 30 years things have continuously changed. Economy and politics are not only heavily knotted with each other but most of the decisions themselves cannot be made only based on a local, regional or not even national thinking. The global changes – the effects of so-called "globalisation" – influence almost every process, in particular such sensitive, money-intensive fields like transport and construction (e.g. prices for oil, steel, etc.). Therefore one of the main groups that has to be approached by scientists and researchers is the consumer itself since it is him whose needs (very often needs created by manipulation) build the basis for decisions finally causing excessive land consumption and urban sprawl.

3.2. Manipulation or Enlightenment?

For tackling this big challenge it is helpful to know the functioning of public manipulation and political decision-making. Edward Bernays' book "Propaganda", published in 1928 for the first time and since then a practical manual for million of people working in the PR (public relation) branch, clearly shows what the matter of fact is. The first lines of chapter 1 explain the functioning of mass manipulation in a very open way: "*The conscious and intelligent manipulation of the organized habits and opinions of the masses is an important element in democratic society. Those who manipulate this unseen mechanism of society constitute an invisible government which is the true ruling power of our country.*" [Bernays, 1928]. Apart from the works of other PR pioneers like Ivy Ledbetter Lee, who developed the press release in 1904, the ideas and methods of Edward Bernays, who was born in Austria (as a nephew of Sigmund Freud) and emigrated to the USA in his childhood, have been taught to PR students most probably all over the world, which also makes most issues global phenomena. But it is again in his book where researchers and thus also cartographers can find a clue how to answer to this challenge: "*Modern business must have its finger continuously on the public pulse. It must understand the changes in the public mind and be prepared to interpret itself fairly and eloquently to changing opinion.*" [Bernays, 1928]. However, what was valid for modern business in the 1920s is valid for modern science as well, more than ever almost 80 years later, and naturally not in a manipulating but an educational and enlightening way.

3.3. Attempts to define Problems and Challenges

To find adequate means to inform the public about urban sprawl in an effective and sustainable manner scientists and in particular cartographers need to clarify the following questions:

1. What driving forces of urban sprawl can be used as a basis topic for an effective (cartographic) approach raising awareness among the public?

2. How is the presentation of global phenomena influencing the development on the local level possible?

So far only a few works trying to map the "global village" are available [Freitag 2004]. One of the most sophisticated examples is the "Atlas of Globalisation" which was published by LE MONDE Diplomatique (2003). Another comprehensive approach is the works included in the project "Shrinking Cities", e.g. combining urban planning and art by using different kind of media.

3. If passive ways such as internet presentations and scientific publications are insufficient to reach a reasonable number of people what are more active options to approach people's minds and raise their awareness?

4. Is the direct way of informing people about urban sprawl appropriate to solve the problem? Is it moreover necessary to implement indirect approaches in order not to frighten the public off or drive them into a lethargic behaviour or make people blame others first instead of feeling responsible themselves as well?

5. Who can act as multipliers to distribute the results and findings of the researches? School teachers? Scientists? Artists such as painters? People known via the media?

6. Is there even a commercial use possible that combines the positive effects of enlightening the public and that is also financially self-supporting?

These and a number of further questions need to be asked and clarified before the specific cartographic works can be started since they build the base of the whole project.

3.4. Cartography as an Intermediating Science

Cartography is an inter- and transdisciplinary science. Data recorded and collected about a certain topic will be analysed and eventually presented in maps or related digital and analogue form. Very often the provider of the data and the end user of the cartographic product are members of different scientific or social groups. It is thus the fundamental "mission" of the cartographer to ease the understanding of different branches. Urban sprawl with its complex theoretical background and widespread practical applications creates several links between different scientific sectors (see figure 2), and maps as well as other cartographic products can act as important tools.

4. SUMMARY AND OUTLOOK

A sustainable development can be achieved only by disconnecting the settlement development from the economic growth, e.g. by a consequent usage of derelict land for revitalisation or recycling measurements. One essential issue is thus the reduction of the manifold obstacles for the revitalisation of these areas (e.g. unsettled ownership structures, land contamination, endeavours of speculation of the owners; Tomerius & Preuß 2001). This long-term learning and working process requires open-minded discussions among the groups and persons involved (municipalities, owners, possible users, planning offices, residents, scientists, etc.). Therefore it is indispensable to shed light upon the manifold economic, social and ecological effects of heedless urbanisation, and the complex interactions emerging from these impacts and to sensitise people via the media (TV, radio, newspapers, journals, etc.) and also in schools.

Tackling this big challenge in order to limit land consumption and to avoid further urban sprawl is not only a German but a European-wide and moreover an even global issue of these days. Cartography – as an inter- and transdisciplinary science – could play an important role in these learning and working processes as an intermediary between the different scientific branches dealing with the urban development and in particular urban sprawl.

The problems of urban sprawl create challenges that – directly or indirectly – affect literally all sectors of the societal life. In the end the question is if and how fast these challenges will be understood and moreover accepted by each member of the society.

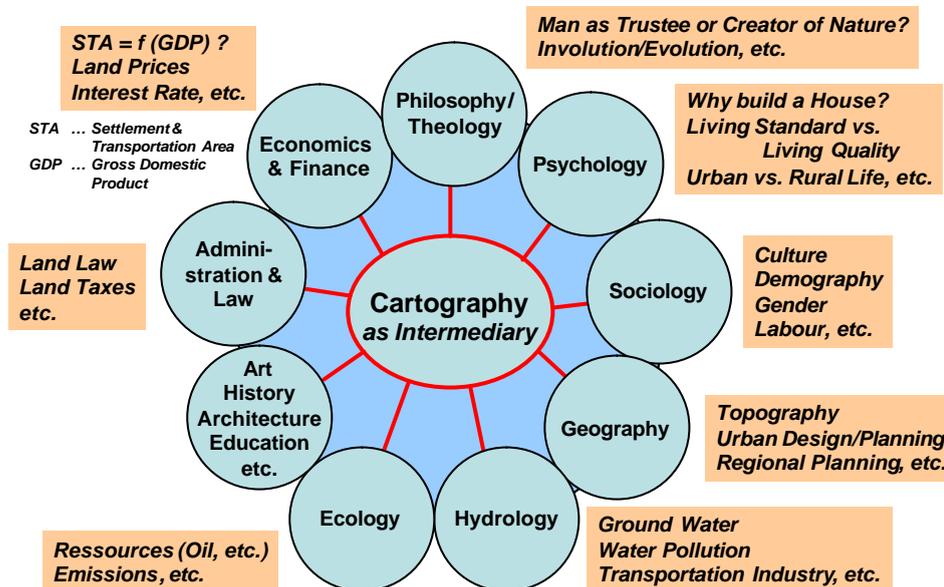


Figure 2: Cartography – an interdisciplinary science and its intermediary capabilities.

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Webpage IfK: <http://web.tu-dresden.de/kartographie/>

Webpage IOER: www.ioer.de