Land policy against urban sprawl in Germany

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Presentation outline

Land policy against urban sprawl in Germany

1. Urban sprawl – characteristics, trends and drivers
2. The region is the town - challenges and impacts
3. The 5 C-Strategies against urban sprawl
4. Conclusions
Characteristics of Urban Sprawl

- Urban sprawl is commonly used to describe physically expanding urban areas.
- Physical pattern of low-density expansion of large urban areas, under market conditions, mainly into the surrounding agricultural areas.
- Sprawl is the leading edge of urban growth and implies little planning control of land subdivision.
- Development is patchy, scattered and strung out, with a tendency for discontinuity, leaving agricultural enclaves.
- Sprawling cities are the opposite of compact cities: full of empty spaces that indicate the inefficiencies in development and highlight the consequences of uncontrolled growth.
- No common definition and concept to measure urban sprawl.

Source: EEA Report 2006

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Levels of urban sprawl

Regional level:
- The region is the town
- Specialization and suburbanization of urban functions

Local level:
- Single house areas
- Low density
How to measure urban sprawl?

- Expansion of urban and infrastructure land
- Decreasing density of buildings and inhabitants

Inhabitants per km² in Germany, 1992–2003

Drivers of urban sprawl

1. Economic factors
   - Economic growth (?)
   - Globalization
   - European integration
   - Price of land
   - Availability of cheap agricultural land
   - Competition between municipalities

2. Demographic factors
   - Population growth
   - Increase in household formation
   - Rising living standards
   - More space per person
   - Housing preferences

3. Deficits of inner urban areas
   - Poor air quality
   - Noise
   - Small apartments
   - Unsafe environments
   - Social problems
   - Lack of green open space
   - Poor quality of infrastructure

4. Transportation
   - High rate of private car ownership
   - Availability of roads
   - Low cost of fuel
   - Poor public transport

5. Regulatory frameworks
   - Weak land use planning
   - Poor enforcement of existing plans
   - Lack of horizontal and vertical coordination and collaboration
Population density and energy consumption

Energy consumption per capita (1,000 millions of joules)

Population density (inhabitants/ha)

Source: Newman & Kenworthy 2006

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Population density and CO2 emissions

Total CO2 emissions per capita (tonnes)

Inhabitants per hectare of urbanised land

Source: Ambiente Italia 2005

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Population density, energy consumption and cost of transport

<table>
<thead>
<tr>
<th>Density (population + jobs per hectare)</th>
<th>Annual energy consumption for travel (mega joules per inhabitant)</th>
<th>Cost of transport (% of GDP)</th>
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<tr>
<td>&lt; 25</td>
<td>85 000</td>
<td>12.4</td>
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<td>25 to 50</td>
<td>20 200</td>
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</tr>
<tr>
<td>50 to 100</td>
<td>13 700</td>
<td>8.6</td>
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<tr>
<td>&gt; 100</td>
<td>12 200</td>
<td>5.7</td>
</tr>
</tbody>
</table>

Source: Newman & Kenworthy 2005

Impacts of Urban Sprawl

Ecological and environmental impacts
- Land sealing and losses of soil
- Losses in fauna and flora
- Consumption and fragmentation of open countryside and green spaces
- Increased consumption of energy and greenhouse-gas emissions
- Negative impact on global and urban climate

Urban impacts
- Rapid expansion of urban areas and decreasing density in inner urban areas
- Segregation of urban functions and facilities
- Increasing demand on road infrastructure
- Decreasing demand on public transportation
- Increasing costs of transportation
Impacts of Urban Sprawl

Impacts on the society and urban economy
• Social segregation and fragmentation
• Negative impact on urban quality of life of citizens
• Lack of creative milieus
• Negative impact on the capacity of the economy (innovation and growth)
• Increasing vulnerability and risks

Cologne, Germany (2006): Turkisk people in the inner city

Strategies against urban sprawl

The 5 C-principles for the implementation of strategies against urban sprawl:
1. Containment – restricting the urban areas by zoning
2. Cooperation – collaboration between the public and private sectors within a regional land policies
3. Concurrency – higher quality of development by economic instruments (e.g. Transferable Development Rights (TDR))
4. Conversion – reuse of brown field land within a cycle land use strategy
5. Carrots – incentives for inner urban development e.g. by providing high standards of infrastructure
Economic instruments in spatial development

• Urban sprawl land consumption grow despite of well-established land use policy.
• The present instruments based on command and control have been only partially successful in preventing.
• Need for economic instruments in addition to planning tools:
  – Financial instruments (e.g. land use tax, land tax, fees for land use or land sealing and de-sealing benefits)
  – Quantity instruments (e.g. Transferable Development Rights (TDR))
• Basis of economic instrument in spatial planning are the external costs: both extensive and intensive land use cause external effects (external costs)
• Successful experiences with economic instruments with environmental policies (waste water fees based on the principle, who causes the impacts has to pay; transferable CO2 -contingents)

Transferable Development Rights (TDR)

• Early concepts of Coase (1968) and Montgomery (1972)
• Possibilities to transfer the experiences in US since 1968 are limited because of the legislation concerning land use rights
• Discussion of TDR in Germany since 2003, to integrate market mechanism in local and regional planning
• Background: Two central targets of environmental land use policy in Germany:
  – Quantity target: decrease of land consumption for urban and transportation demands on max. 30 ha/day by 2020
  – Quality target: relation of inner development to external development 3 : 1
**Concept:**

1. Definition of absolute limit of quantity of total building land in one period (e.g. 30 ha/day)
2. First allocation of Development Rights by the following criteria:
   a). socio-economic and space parameters,
   b). land use within the last planning period or
c). ecological parameters.
3. Trade of Development Rights directly between the communities and between the communities an TDR-Bank

**Allocation of TDR**

- Multilevel-model
- First allocation of Development Rights
- Top-down to achieve the quantity target
- Separation of land contingents for
  - building suites (inhabitants, area etc.)
  - regional demands (regional infrastructure)
  - reserve contingents for special targets
Transactions of TDR

Abandonment of the development of new building areas

- selling town
- Reduction zone
- sale of TDR
- price of TDR
- Public TDR-Bank

buying town

extention zone

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Opportunities, problems and open questions

- The 30 ha-quantity target can be achieved
- TDR effect only the growth rate of land consumption, the existing urban land use can not be reduced
- Only market orientated strategy is in opposite to the current principle of waging within the planning process
- The guiding of the quality of land use, especially the guiding of the places are insufficient
- The results for the settlement structure will not fulfill the demands of a polycentric concentration target of sustainable development
- Negative impacts in suburban regions with high growth rate
- What are the Impacts on the other land saving strategies and measures of spatial development?
- Are there incentives for communities and how will be the acceptance on the local level of the communities?
Conclusions

- Urban sprawl as very inefficient form of land use and consumption of landscape is of political interest in Germany since the 1970s
- **Policy-mix** is needed: Combination of public policy law, planning, nature protection law and economic instruments
- Economic instruments are useful to **support the realization of spatial planning** and necessary to achieve the quantity 30 ha-target until 2020
- Transferable development rights can not replace the planning instruments and nature protection law, but they have additional effects on land allocation.
- The TDR are generally realistic, but a lot of questions concerning the organization, the methodical approach and the law have to be investigated.

Thank You very much!
Strategy: Mix and integration of different Policies

- comprehensive city development plan: compact - urban - green
- regional cooperation in land management
- stakeholders' involvement in city planning;
- emphasis on reuse of vacant brownfield land
- continuously improving public transport with as few new roads as possible;
- consequent land management

Munich – development plan 2005
Green – compact - urban

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Inner urban development

Strategy inner urban development by reuse of brownfield land:
- military areas
- commercial areas
- transportation areas

Munich – development plan 2005
Green – compact – urban

Conversion of a former container terminal

Source: www.stmugv.bayern.de
Sprawl impacts on agricultural land and natural areas, selected European cities

Development of built-up area, road network and population

Note: Countries covered are: Belgium, Czech Republic, Denmark, France, Germany, Latvia, Lithuania, the Netherlands, Poland, Slovakia and Spain.

Source: EEA Report 2006
How to measure urban sprawl?

- Expansion of urban and infrastructure land
- Decreasing density of buildings and inhabitants

Urban sprawl in Germany, Poland and Czech Republic (1990–2000)

Inhabitants per km² in Germany, 1992–2003

Source: BBR: Raumordnungsbericht 2005

Trends

Annual growth of built-up areas from the mid-1950s to the late 1990s, selected European cities

Source: EEA Report 2006