

Green strategies against increased land consumption in Germany

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Abstract — Excessive land consumption is one of the more serious threats to the environment in Germany. Each day about 110 ha of cultural landscape are transformed to roads or settlement. This paper focus on two “green” strategies devised to address this issue: 1) the mandatory obligation to compensate for each impact, and 2) the opportunity to involve private house buyers in order to achieve more density. It is shown that the obligation to compensate has a significant effect on land consumption. The involvement of private home buyers via a multi-attribute survey demonstrates that green spaces and social infrastructure are crucial elements when considering less consumptive development alternatives. Therefore, the traditional planning tools, which are mostly reactive, should be expanded to include conservation strategies and state-of-the-art social science methods to explore the demand for non-existing developments and to influence the future market.

Index Terms — Land consumption, compensation measures, open space, new concepts for urban green.

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1 INTRODUCTION

Each day about 110 ha of cultural landscape in Germany are transformed into roads or settlements. Since 1992 about 430 km² of land have been converted in this manner annually. This immense land consumption is one of the most severe threats to the environment in Germany as well as in other European countries.

Several strategies have been proposed to combat the problem:

- to consider the topic in regional and master planning processes,
- to reduce land consumption by converting former industrial or military zones, and

- to develop new concepts of intercommunal cooperation.

These ideas also represent the main approaches by the responsible German authorities for housing and development (see [1], [2]).

This paper will discuss two “green” strategies devised to address the issue of land conversion in the field of housing development:

- the mandatory obligation to compensate each impact, and
- the opportunity to investigate the preferences of private house buyers.

2 POSSIBLE NEW STRATEGIES

2.1 The effects of compensation

In 1998 the federal German building code was amended to include mitigation and compensation for land consumption due to housing development. The options for compensation were designed in an adaptable manner, and each state implemented this legal requirement differently. Using the State of Bavaria

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as a case study, where the strategy has been applied for the past eight years, I will investigate whether this legal instrument and the local adaptation actually achieve the goal of reducing land consumption.

2.2 Involvement of private house buyers

A second possible strategy can be built on the analysis of the decision making behaviour of private house buyers in order to influence the market. The discussion of this strategy is based on a recent study ([3], [4]), which included a large questionnaire and covered ecological, social and economic dimensions.

3 RESULTS

In the following the statistics of the land consumption across Bavaria is presented. In addition to the new regulations on compensation, the Bavarian Ministry on Housing and the Ministry on Environment, as well as the Bavarian associations of municipalities and communities jointly initiated a communication campaign in order to increase the acceptance of a new guideline on compensation and to improve awareness about increasing land consumption. An evaluation of the implementation strategy of the new guideline on compensation measures revealed that it was implemented correctly ([5]).

Figure 1 shows that the Bavarian regulation on compensation was successful and had – compared to other German states

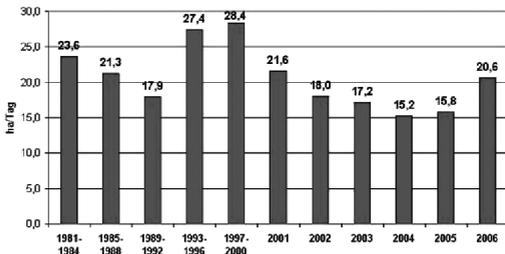


Fig. 1. Development of land consumption in Bavaria (ha/day). [5]

Attribute	Status Quo	Scenario 1: „High Density“	Scenario 2: „High Density and High Quality of Green Space“	Scenario 3: „High Density and High Quality of Green Space and Center for local supply.“					
Density	Low Density	High Density	High Density	High Density					
Quality of green space	Low quality	High quality	High quality	High quality					
Center	No center	No center	No center	Center for local supply					
Infrastructure	Printed car park	Parking lot	Parking lot	Parking lot					
Public transport	Good and frequent connection	Good and frequent connection	Good and frequent connection	Good and frequent connection					
Technical Infrastructure for Resource Protection	given	given	given	given					
Social Mix	Low social Mix	Social Mix given	Social Mix given	Social Mix given					
Costs	Higher Costs than Scenario 1-3	Lower Costs than Status Quo	Lower Costs than Status Quo	Lower Costs than Status Quo					
Market share of Scenario:									
	SQ	Sz. 1	N/N	SQ	Sz. 2	N/N	SQ	Sz. 3	N/N
„environmental friendly“ Respondent:	3%	91%	6%	3%	92%	5%	1%	97%	2%
„non environmental friendly“ Respondent:	51%	28%	11%	44%	47%	9%	42%	49%	9%
All Respondents:	41%	49%	10%	36%	55%	9%	34%	59%	7%
<small>Explanation: „SQ“ means „Status Quo“, „Sz.“ means „Scenario“ and „N/N“ means „neither-not-Alternative“</small>									

Fig.2. DSS Analysis of the different scenarios compared with the Status Quo

– the desired effect. Land consumption was reduced from 28,4ha per day from 2000 to 15,8ha in 2005; it seems to increase again thereafter. The reduction was observed immediately after the introduction of the new regulation on compensation measures in the year 2000.

The trends in figure 1 led to the impression that the communities became partly accustomed to the compensation and that therefore the reduction of land consumption is now not as strong as it was initially.

A detailed analysis [6] of the land consumption shows that it is not directly linked to population growth. While the land consumption increased from 1980 to 2006 to 40%, the population growth for the same period was only about 14%. Complex socio-demographic and societal reasons were cited as reasons by governmental bodies [6].

Consequently research was undertaken on the societal background to these trends, in order to see how they could be influenced.

It turned out, that the majority of private home buyers is still dreaming of a detached house. Almost 90 % of the respondents who wish to purchase residential property in rural or sub-urban regions would like to buy or build a single family house rather than live in an apartment.

The study used a discrete choice experiment to investigate the preference of potential home buyers for a wide range of possible planning scenarios. These options described

more sustainable forms of housing development in which densities would still be acceptable to respondents. The resulting decision support system (see fig.2) showed that a dense type of settlement would only be accepted if private gardens and green spaces around the buildings are maximized.

Secondly, the implementation of a local small neighbourhood centre in close proximity to new homes is another strong attraction for denser built-up spaces instead of detached house developments. A high level of interest also exists for cost effective, environmental friendly new technology, which can be achieved easier in cooperation with neighbours in closer proximity.

4 CONCLUSION

Four main strategies have been presented to reduce land consumption. Regional planning and communal master planning have traditionally served as key instruments for directing land consumption in Germany. However, these instruments do not react easily to societal trends, and are hardly used in a forward-looking strategic manner. Since intercommunal cooperation is only helpful to create joint industrial zones and the amount of convertible land is quite limited, the effects of all these strategies are confined.

Therefore new strategies must be explored to include latent demands for fundamentally new development alternatives. The paper also shows that instruments of nature conservation as well as green building concepts may influence these issues significantly. Compensation leads to reduced land consumption, and building codes which include attractive green spaces improve the acceptance of denser built environments. Communities and developers will not succeed with new housing concepts unless they take the interests of their future residents into account. Among them, the role of green spaces such as small parks and other forms of public green play a major role.

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