



Tradable planning permits for land-use control in Germany

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ABSTRACT

In addition to a broad range of qualitative land development objectives, the German Federal Government has committed itself to reduce the growth of settlement and traffic areas from currently 113 ha (2004–2007) to 30 ha per day by 2020. In order to attain this ambitious quantitative goal, our paper presents a market-based policy of ‘tradable planning permits’. This system would control land development by fixing the total amount of open space loss in a period with allocated planning permits, which can be traded between local jurisdictions. Since this approach is based on the cap-and-trade principle, we evaluate the transfer of traditional emission trading concepts to land-use control and explore regulatory options of potential systems: an undifferentiated permit system, a trading-ratio system and variations of zonal permit systems. We subject these alternative approaches to critical evaluation by using a variety of important criteria including efficiency gains, ecological effectiveness, hot spot formation and transaction costs. Finally, we summarize the potentials, limitations and risks of a permit trading system in general while reflecting the ongoing German debate on open space preservation.

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Introduction

Similar to other densely populated countries, there is a general interest in Germany in the preservation of undeveloped land or open space. In contrast to other countries, however, Germany has formulated a quantitative national target for land-use control. In order to decelerate the conversion of undeveloped land and to preserve open areas, the German Federal Government has made a commitment to reduce the growth of settlement and traffic areas from recently 113 ha (2004–2007) to 30 ha per day by 2020 (Statistisches Bundesamt, 2008).² This periodic regulatory target is ambitious, as the constant high demand for settlement areas seems to leave local authorities unable to adequately restrict land development. The high demand for new houses, factories, offices and other facilities has induced land-use planners to seek more effective planning strategies. At the same time, economists

observe inefficient land-use patterns due to various market failures and have called for economic instruments rather than stricter planning controls. Economists and planners in Germany have therefore turned their attention to more flexible approaches containing integrated market mechanisms that would lead to more efficient land-use allocation. Unlike other developed countries, Germany’s land-use planning system has not included integrated market-based strategies up to now. Other countries have meanwhile gained experience in market-based instruments, such as transferable development rights (TDR) (Mills, 1980; Johnston and Madison, 1997; Pruetz, 1997, 2003). Most of these programmes are designed to preserve natural habitats and open space by compensating landowners who lose the right to develop their property. All TDR programmes operate on a small scale within a particular community or region, characteristics that do not allow for effective regulation of national targets. An attainment of the ‘30-ha-target’ would require policies at national level with direct control of land-use decisions made by local authorities. In this regard a system of tradable planning permits (TPP) (Maier-Rigaud, 1994; Bizer, 1996; Bizer et al., 2008) seems to be a promising instrument and is a crucial part of the political debate on the implementation of the 30-ha-target.³ Since this approach is based on the

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² The 30-ha-target was first formulated by a parliamentary sub-committee (Enquête-Kommission ‘Schutz des Menschen und der Umwelt’) and the German Federal Environment Ministry in 1998. The German Federal Government’s ‘National strategy for sustainability’ from 2002 and the coalition agreement of the last government met this target in 2005 (Bizer et al., 2008, pp. 21–23). For a critical reflection on the 30-ha-target, see Davy (2009).

³ In the (German) literature also known as land dedication allowances, zoning rights, quotas or development rights (Hansjürgens and Schröter, 2004; Walz et al., 2005; Nuissl and Schröter-Schlaack, 2009).

cap-and-trade principle, we evaluate the transfer of traditional emission trading concepts to land-use control and explore regulatory options of potential systems: an undifferentiated permit system, a trading-ratio system and variations of zonal permit systems. We subject these alternative approaches to critical evaluation by using a variety of important criteria including efficiency gains, ecological effectiveness, hot spot formation and transaction costs. Finally, we summarize the potentials, limitations and risks of a permit trading system in general while reflecting the ongoing German debate on open space preservation.

In contrast to command-and-control measures, tradable permit systems meet ecological goals by pre-defined caps, allowing agents considerable flexibility in deciding how to comply with the regulation. Based on this idea, a 'planning permit' market provides a great opportunity to relax excessive planning regulations, which could otherwise cause more negative effects than those of unregulated land development (cf. Mills, 1980; Cheshire and Sheppard, 2002; Nuijss and Schröter-Schlaack, 2009). By restricting the total amount of land development in a given period, a permit scheme can support high-density land use, thereby limiting urban sprawl. The aim of a TPP system is to remedy market failures by curbing the environmental degradation activities of municipalities, investors and landowners. Both the benefits and externalities of land development are reduced as developers pay a higher price for the public goods of scenic amenities, and overall development is in line with the ecological goal. However, optimal designs of trading programmes are highly dependent on the nature of the regulated pollutant. Since we interpret the complex process of land development in analogy to a non-uniformly mixed pollutant, an appropriate TPP system should consider spatial aspects such as the relationship between soil function changes and the resultant environmental impact. Unlike the regulation of pollutants that mix uniformly in space (e.g., carbon dioxide), a permit scheme that deals with non-uniformly mixed pollutants should not only control the level but also the location of emissions. In other words, the challenge for an environmental authority is to meet a range of specified spatial and quality goals. Trading programmes that address these issues are faced with the fundamental problem of high transaction costs that could exceed predicted efficiency gains (e.g., Baumol and Oates, 1988; Tietenberg, 1995, 2006). In light of this trade-off, the programmatic characteristics of alternative trading schemes in land-use control need to be identified and their effects assessed.

This paper is organized as follows: the second section describes the current unsustainable land-use development that justifies an intervening regulation and identifies the relevant actors in the land development planning process in Germany, which functions as the basic framework into which TPP must be fitted. The third section explains the functionality of the TPP system and discusses the basic dilemma of regulating land development. The fourth section presents three alternative approaches for a TPP system in Germany, using theoretical models and empirical experience. Finally, we evaluate these programmes along various criteria and discuss the overall potentials and risks of 'planning permits' as a complementary planning instrument.

An economic viewpoint: failures, externalities and land-use planning

Market failures and externalities

Land development, i.e., the growth and spread of settlement and traffic areas, poses a significant threat to the quality of the natural environment, leading to loss of open space, habitats and biodiversity (cf. Burchell et al., 2002; Ewing et al., 2003; Bellot

et al., 2007; Nuijss et al., 2009). The global phenomenon of land 'over-development', labelled urban sprawl, radically impacts on air quality, public health, social integration and the cost of infrastructure (cf. Ewing, 1994; Frumkin et al., 2004; Siedentop et al., 2006; Stone, 2008). In this light, sprawl is increasingly viewed as a significant problem that generates considerable environmental and social – current and future – costs.

The extent of sprawl is determined by the aggregation of individual land-use decisions made by heterogeneous groups of public and private actors. Municipalities have a constitutional right in Germany to plan and to supply developed sites; on the demand side private households and enterprises require new sites for housing, industrial or other developments (Bizer, 2005; Nuijss and Schröter-Schlaack, 2009). Additionally, municipalities and the public sector in general provide land-intensive infrastructure facilities and services (e.g., streets, highways, sewage plants, administration buildings). As discussed frequently, this development process is characterized by various types of market failure and incorrect price signals on the demand side (e.g., Mills, 1980; Pruetz, 2003). Land development activates anthropogenic production and carrier soil functions, while ecological regulation and habitat soil functions are affected negatively (Beese et al., 1995). Natural soil functions have public good characteristics and ill-defined property rights. They are non-rival and non-excludable in consumption. In contrast, human land use can be characterized as having the properties of a private good. Consequently, natural soil functions are not optimally priced, while 'developed' uses do not cover the full cost of the negative effects of land development (Scott et al., 1998; Haberl et al., 2004).

Another significant failure is the over-supply of developed sites by local jurisdictions. As voiced frequently by critics, municipalities prepare developed sites and provide infrastructure without adequate information on (i) the demand for residential housing or future investments (Siedentop et al., 2009) or (ii) the total cost of land development (Peiser, 1989; Ecoplan, 2000; Carruthers and Ulfarsson, 2003; Siedentop et al., 2006). By developing new areas, community politicians and planners hope to attract new residents and protect their revenues (e.g., income tax, business tax). This sort of 'supply planning' can be explained by the community focus on potential revenues and the inability to calculate long-term costs accurately (e.g., Siedentop et al., 2006). Of particular relevance to these failures are the various interdependencies and spatial externalities associated with developing land. New settlement areas entail social costs and negative spatial externalities that are not taken into account by the municipalities. Hence local authority decisions do not entirely reflect local preferences for land-use development (cf. Kline and Wichelns, 1996; Burchell et al., 2002; Hellerstein et al., 2002). Apart from this data and issues of externality, local authorities are in competition with other municipalities for solvent citizens and firms, leading to a further increase in the rate of land development.

Land-use planning and current challenges

As a result of the failures described above, Germany has seen a continuous expansion of developed areas during the last few decades. Driven by economic growth, the increase in settlement and traffic areas has not subsided, despite a more moderate population expansion in recent years. There is growing concern about future demographic decline, not only in terms of the environmental and social costs of 'growth sprawl' but also of the additional cost of operating urban infrastructure for 'shrinkage sprawl' (especially in several areas of eastern Germany; Nuijss and Rink, 2005; Fina and Siedentop, 2008). An active debate on new policy instruments for the management of sprawling developments and the protection of

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