

The potential effect of national growth-management policy on urban sprawl and the depletion of open spaces and farmland[☆]

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Abstract

The debate over the effectiveness of growth-management policies reinforces the importance of empirical studies in this field, which has become not just relevant but also crucial to many places. Israel, through its spatial national-level planning, experienced especially during the 1990s, presents an empirical example that may be used to address a complementary strategy to the one that is most commonly used, as this paper suggests. This strategy is based on an examination of the future potential impact of growth-management tools proposed by national plans on the depletion of open space and farmland versus the consequences expected from the continuation of current trends. Accordingly an appropriate methodology is introduced for implementing this strategy.

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Introduction

The implementation of growth-management policy by means of effective tools is a concern of many developed countries trying to restrain urban sprawl and its implication for open space and farmland. The by-products of urban development in extensive open space and farmland are manifested in damage caused to natural resources, a reduction in open space on the regional level, damage to farmland, a diminishing and even extinction of fauna and flora species from the fragmentation of ecosystems, and a vast growth in surface run-off, causing flood risks. In addition, urban development damages the aesthetics of the natural landscape, blocks the horizon, and creates a monotonous, dull urban landscape (Johnson, 2001; Wu and Gar-On Yeh, 1997; Burchell et al., 1998; Downs, 1998). Apart from its importance for agricultural production, a major role of farmland is its preservation of open space. Functioning as a buffer zone between urban areas, open space provides them with a distinct spatial identity,

while emphasizing the clear lines between open and built-up areas (Rose, 1984; Nelson, 1992).

These are some of the main reasons that led many scholar, practitioners, and decision-makers to take up the struggle to restrain urban sprawl. During the last 20 years, the number of places that have adopted and developed growth management has increased (Ewing, 1994, 1997; Gordon and Richardson, 1997; Burchell et al., 1998; Hadly, 2000; Razin and Rosentraub, 2000). The issue of the depletion of open space and farmland is of crucial importance to Israel because of its small size and rapid population growth, but it is also highly relevant to numerous other places as well. Growth-management policy, however, is in contradiction to free-market forces, mostly in its objection to local interests, and requires legislation and changing ordinances and regulations. Concomitantly, the lack of empirical evidence of the success of the adopted policy indeed harms the ability to convince the authorities to adopt it (Burchell et al., 1998; Johnson, 2001; Carruthers, 2002).

The aim of this paper is to address a complementary strategy, based on empirical data gathered from the Israeli case, to that most commonly used. The paper presents methodology and empirical results obtained from an evaluation of the expected effect of national planning policies on the prevention of urban sprawl and the depletion of open space. In this context, Israel

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provides an appropriate case through its spatial national-level planning, which actually took place during the 1990s. This evaluation is highly recommended for places that are considering adopting a growth-management policy. For them a quasi-experimental analysis of different scenarios that may occur in the future is of utmost importance in the evaluation process of the proposed policy under consideration.

Background

The concern over unrestrained suburbs has forced many cities and states in Europe and North America to legislate “smart growth” policies. By changing the spatial morphology of urban growth, they have in practice adopted growth-management tools in order to prevent the continuation of urban sprawl (DLCD, 1992; Weitz and Moore, 1998; Nelson, 1999; Torrens and Alberti, 2000; Johnson, 2001). During the 1980s and 1990s, growth-management tools derived from the compact city and new urbanism perceptions were developed and implemented extensively (Fulton, 1996; Jenks et al., 1996). The new approach promoted the preservation of open spaces by focusing on compact, mixed use, and clustered development. Concomitantly, evidence of the effectiveness of the tools in preventing sprawl started to appear in the literature (DLCD, 1992; Nelson and Moore, 1996; Nelson, 1999; Pendall, 1999; Carruthers, 2002). Nonetheless, it is still difficult to say that growth-management policy succeeds in preventing urban sprawl or in achieving sustainability (Fulton, 1996; Dieleman et al., 1999; Williams, 2000; Kline, 2000; Bontje, 2001). A trenchant debate prevails among scholars over the efficiency of growth management and its operational ability to restrain sprawl.

Many of the tools developed were designated to reduce the conversion of open space and farmland into urban land uses. The importance of protecting farmland increases as population grows and is not, however, restricted to food production. Farmland provides open space for urban residents; allows for the absorption of rainwater, thus improving the water balance of the region; and offers protection against flooding. Furthermore, vegetation helps in the treatment of air pollution and excess carbon dioxide by converting the latter into oxygen (Coughlin and Keene, 1981; Nelson, 1992; DeGrove, 1995). Concomitantly, the sprawl of developed areas onto farmland creates undesirable effects on the quality of this land. The penetration of urban population into rural areas located close to cities creates expectations of value increase for the farmland designated for development uses and a decrease of its agricultural value (Sinclair, 1967; Rosser, 1978; Nelson, 1986).

Among the physical tools that were developed in order to restrain the conversion of farmland, perhaps the most potentially effective device is *exclusive agriculture zoning*, which Oregon and Hawaii apply through statewide control (Coughlin, 1991). Alterman (1997) found that the most common tool across the US was the *nonexclusive zone* which is much more flexible than agricultural zoning. Zoning may also include physical restrictions in dictating the land-use pattern in order to protect agricultural land (Hadly, 2000). The idea of green belts, adopted mostly in Britain, though also found in other countries, is another popular means of setting limits to city expansion (Longley, et al., 1992; Alterman, 1997).

Another group of tools regarded as a means of targeting development and implemented in the US under the growth-management framework are the *urban growth boundaries (UGB)*, which are widespread at the city level (Anderson, 1999; Burby, et al., 2001) and have been adopted widely as a planning instrument (Schiffman, 1999a) within a metropolitan or regional physical plan; e.g., in Oregon and Minneapolis in the US, Melbourne in Australia, Santiago in Chile, and recently also in Israel (Nelson and Moore, 1993; Asif and Shachar, 1999; Melbourne 2030, 2002; Pendall et al., 2002; Wassmer, 2002). *Annexation* is still another means of protecting agricultural land, by preventing open-space annexation to the city (Alterman, 1997). *Transfer of development rights (TDR)* could be a well-targeted tool. It is based on the separation of the development rights of land from its ownership, thus enabling the transfer of these rights from the place where development is undesirable to other, more preferable and suitable places (Juergensmeyer, 1984–85; Anderson, 1999; English and Hoffman, 2001). *Infrastructure concurrency requirements* are recognized mostly in the progressive legislation adopted by Florida; it enables the local authority to determine the location and the timing of development in accordance with the timing of infrastructure development (DeGrove et al., 1992).

Some of the tools gathered from *adequate public facilities ordinances* basically support the justification of transferring the financial burden of public services to the new initiatives. According to Pendall (1999), this type of ordinance constitutes one of the most effective tools in restraining urban sprawl. Other forms of intervention have developed from this concept, among which are the following: *conservation easements* voluntarily transferring development rights to unprofitable organization or funds in exchange for gaining tax rebates and easements; *purchase of development rights (PDR)*, another kind of conservation easement. In this latter case, landowners sell their rights to develop land to the municipality for a limit number of years (English and Hoffman, 2001; Hadly, 2000).

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