



Land Use Issues and Research Opportunities in the US

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“Contributing to the well-being of small towns and rural communities.”

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by Stephan J. Goetz¹

Land use is one of the most contentious natural resource-related issues in the US today. The issue is especially pressing in the Northeast region of the country, which is home to about 20 percent of the population but only 6 percent of the contiguous land mass. In a recent survey, one-third of the faculty in the Northeast land grant system with interests in rural development cited *land use* as the single most important rural development issue facing the region.² No other issue came close.

Urban sprawl is perhaps the most widespread source of concern over land use. While the aggregate social and environmental consequences of sprawl are often collectively viewed as undesirable, the private decisions of households to live in low-density housing settings are rational (implying, to a certain extent, a cognitive dissonance). Suburban homeowners trade off larger and newer homes – which require less maintenance – for longer commutes to work, which are more tolerable if made in a late-model SUV. Rising incomes, purchases of second and third homes, improved transportation and communications networks along with a growing population (12.8 % during the 1990s) are fueling these trends.³

A February 2001 e-mail survey of 22 selected researchers (skewed towards the Northeast) in the land use area suggests that the greatest research needs lie in the area of better understanding the impacts of alternative policies and mechanisms for retaining farmland, as well as in identifying better state and local land use planning tools for addressing sprawl (Figure 1). A related concern is that efforts to combat sprawl are placing upward pressure on

¹ Director of The Northeast Regional Center for Rural Development and Professor of Agricultural Economics, Pennsylvania State University, University Park, PA, USA. Contact: sgoetz@psu.edu or 814/863-4656. Paper prepared for the second annual conference on European and U.S. Partnerships in Food and Agriculture Education and Research, April 4 and 5, 2001, Freising-Weihenstephan, Technical University of Munich, Germany. Except where noted, maps are from these USDA websites: <http://www.nass.usda.gov/census/census97/atlas97/index.htm> and <http://www.nhq.nrcs.usda.gov/land/index/nri97maps.html>.

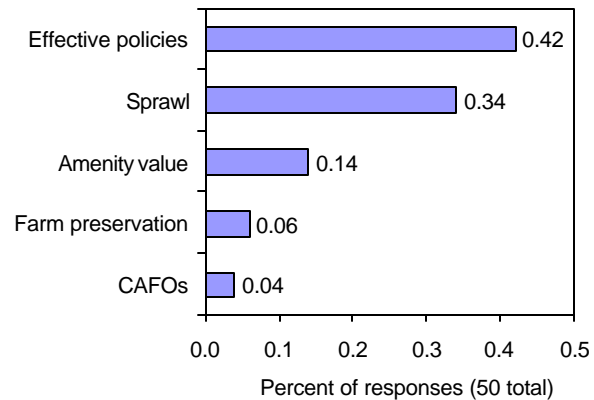
² See *Network* 00, vol. 15 no. 3; available at: <http://www.cas.nercrd.psu.edu>.

³ According to news reports, for example, motor vehicle traffic in the greater Baltimore area increased by an estimated 30% recently, while population in the area grew by only about 10 percent.

housing prices in some communities, making it difficult for low-income groups to obtain affordable housing (e.g., Freeman, 2000). Additional details from this survey or researchers are discussed in the concluding section below.

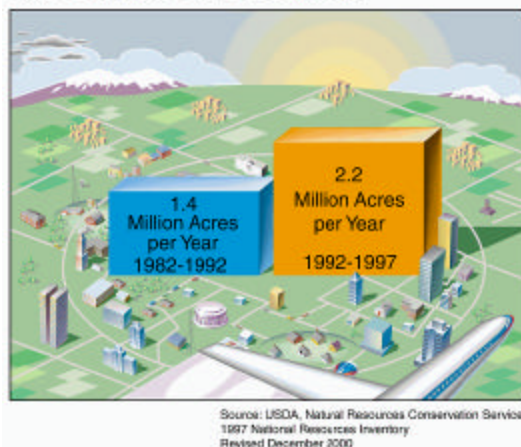
Other research priorities include better understanding of the causes and consequences of urban and suburban sprawl in general, as well as the amenity values of different uses of land (including potential dis-amenities generated by farming). A key subject here is valuing and paying for the non-food services that are provided by land (Libby, 2000). Two other key topics from the survey are farm preservation and dealing with confined animal feeding operations (CAFOs). The first of these raises the question of whether *farmers* or *farmland* ought to be the target of preservation efforts: it may be more cost effective to preserve farmland than farm proprietorships. CAFOs tend to be more important in the Midwest and South, but they are starting to spread into NE states such as Pennsylvania.

Figure 1: Top Land Use Research Priorities



Sprawl, Population Movement and Changing Farm Numbers

Land Converted to Development



A pronounced trend towards sprawling development in the US is evident from the National Resource Inventory. Between 1982 and 1992, 1.4 million acres (560,000 ha) were developed each year. During the economic boom of the period 1992-97, the rate of development accelerated to 2.2 million acres (880,000 ha) annually.⁴ In comparison, the German state of Bavaria extends over 27,238 square miles, or 17.43 million acres.

⁴ See www.nhq.nrcs.usda.gov/

The map on the following page (Annual Rate of Development, 1992-97) shows the high rate at which land was developed in different regions between 1992 and 1997. The red areas represent 2,000 or more acres of land developed annually in a watershed (based on US Geological Survey 8-digit hydrologic cataloguing units). These areas represent 53.1 percent of the developed land and 16.2 percent of the watersheds. Large parts of the eastern seaboard are being developed, for example. In the Northeast, much of the sprawl is along the Boston-New York City-Washington (BosNYWash) corridor, and large cities such as Philadelphia, continue to lose population to their suburbs as well as other regions of the country.

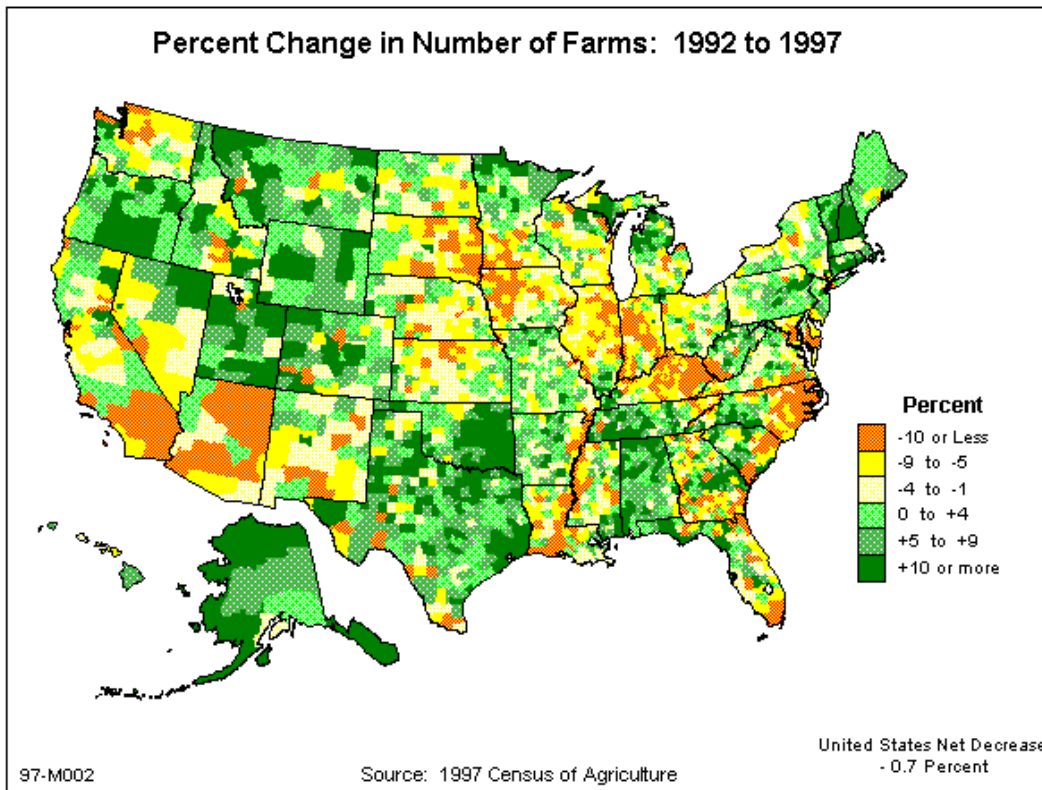
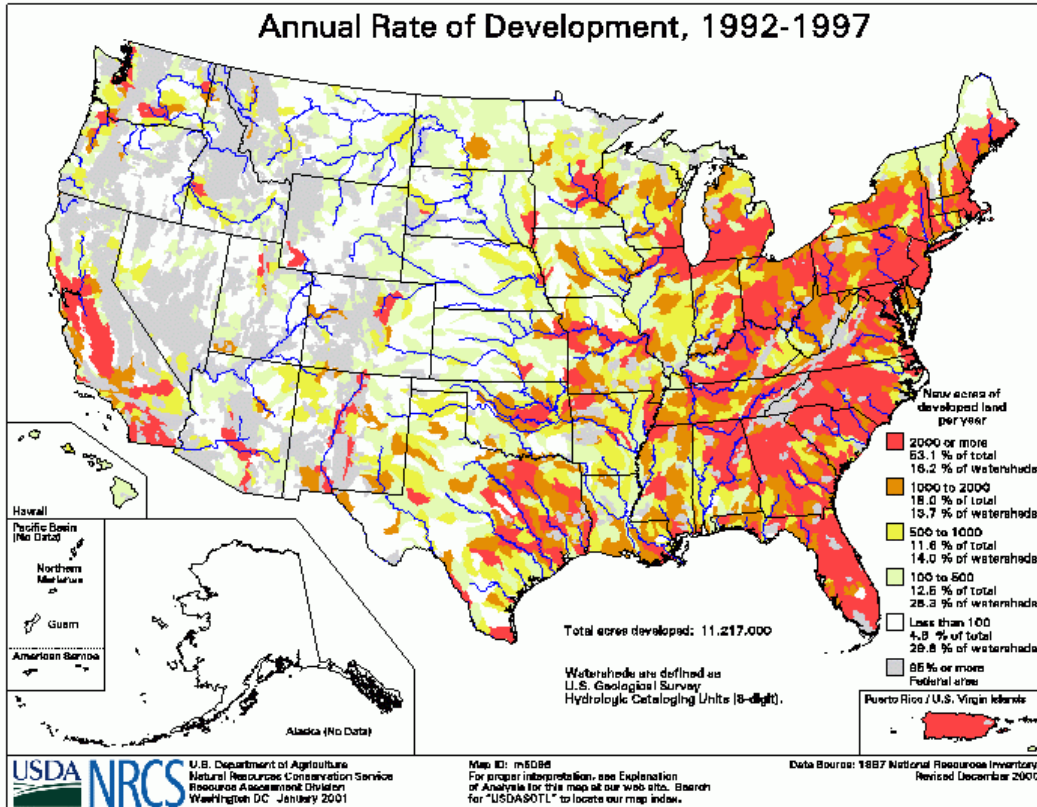
The 2000 Census data now being released also show that the center of the nation is experiencing significant population declines and, not surprisingly, the map shows less development pressure here. In contrast, cities such as Atlanta, GA and Dallas, TX are continuing to sprawl. Texas during the 1990s surpassed New York as the second-most populous US state (see <http://www.census.gov/population/cen2000/phc-t2/tab01.pdf>). This is one manifestation of the relative shift of population from the Northeast and Midwest to the South and West of the Nation.

Although farm numbers have been declining in the US since the beginning of the last Century, as they have in other developed countries, the second map (Percent Change in Number of Farms: 1992 to 1997) shows that this decline is far from uniform over space. In fact, some counties are gaining farm numbers – especially, in the Northeast,⁵ South and Mountain West. Losses of farms are occurring in coastal regions of the Carolinas, Kentucky (as a result of declines in tobacco), the Midwest and northern Great Plains.

The reasons behind the increases in farm numbers, and the characteristics of new farmers, are poorly understood. In some regions, such as New England, some new farms are being established by individuals who lack a farm background but are interested in farming.⁶ New farm formations may also represent hobby or retirement farms, or a splitting of farms among siblings to circumvent the \$100,000 federal farm program payments cap per farm. Recent

⁵ The New England Small Farm Institute last year secured FY 2000 IFAFS (Initiative for Future Agriculture and Food Systems) funding in the amount of \$1.7 million to develop a Northeast services provider consortium entitled “Growing New Farmers.” The purpose of this consortium is to help develop the next generation of farmers.

⁶ At the “Growing New Farmers—A Services Provider Consortium” conference, held in Albany on March 28-29, 2001 and co-sponsored by the Northeast Center, the enormous diversity of new farmers in terms of factors such as age, motivation, experience, capital, training needs and products grown was emphasized.



changes at the National Agricultural Statistical Service (NASS) in the definition of a farm also play a role. For example, maple producers now qualify as farmers, while they did not previously.

In Texas and Oklahoma, rising farm numbers likely reflect a growing number of Hispanic farmers. In fact, Hispanics are now the fastest-growing group of new farmers nationally. The state contrasts in the map are also noteworthy, and suggest that different state policies may be influencing changes in farm numbers (*cf.* Mississippi and Alabama; Missouri and Illinois; Oklahoma and Kansas; and Kentucky and Tennessee).

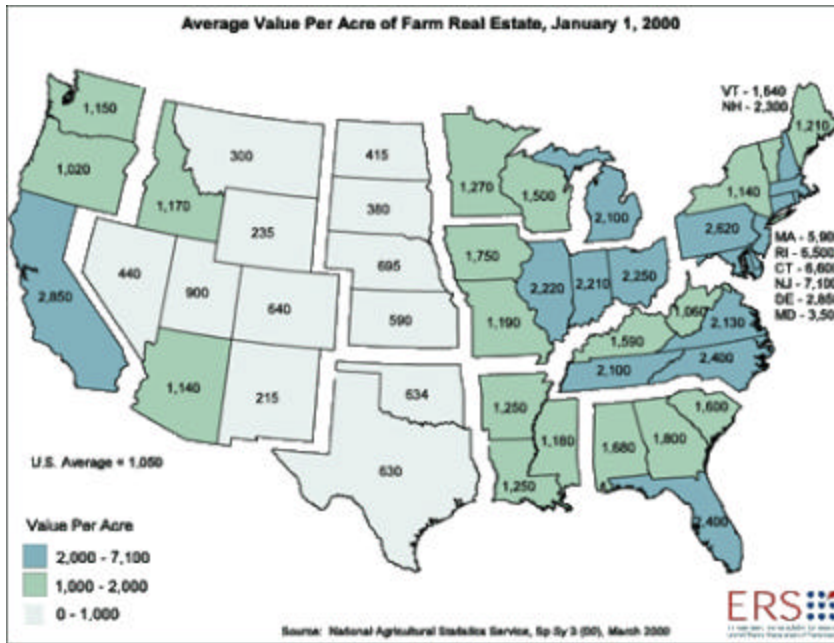
In comparing the two maps, it is noteworthy that new farms are emerging even in areas of rapid land development (such as southwest Pennsylvania, southern New Hampshire, central Alabama and eastern Texas). In other regions, such as coastal North Carolina, the decline in farms goes hand in hand with rapid development. These changes raise the question of how agriculture and farmers can continue to operate under the unrelenting pressure of urban sprawl, especially in the Northeast US.

Land Use Implications for Agriculture

In a market economy, land is allocated to that activity which provides the highest expected return over time.⁷ Although housing development (sprawl) is ostensibly market-driven, the market forces operate within a complex web of laws and regulations, and incentives created by implicit subsidies such as the construction of new roads and mortgage interest payment deductions. A key to sustaining agricultural uses of land in highly populated areas such as the Northeast lies in the profitability of the crops raised on the land. Identifying and growing high value crops is especially critical as rising urban incomes drive up the demand for land along with land values. In this regard, it is interesting to examine how the population pressure affects the behavior of agricultural decision makers in this region.

The Northeast region has 6 percent of the US farm population, but only 2 percent of the nation's farmland (NRCS). Not surprisingly, the NE region

⁷ For example, a piece of land that produces \$1,000 per year in perpetuity in an agricultural use is worth \$10,000 at a 10% interest rate, and \$20,000 at a 5% interest rate. In the absence of fees, taxes and other transactions costs, this is how much a developer would have to pay for the acre to bid its services into other uses (such as construction of residential housing).

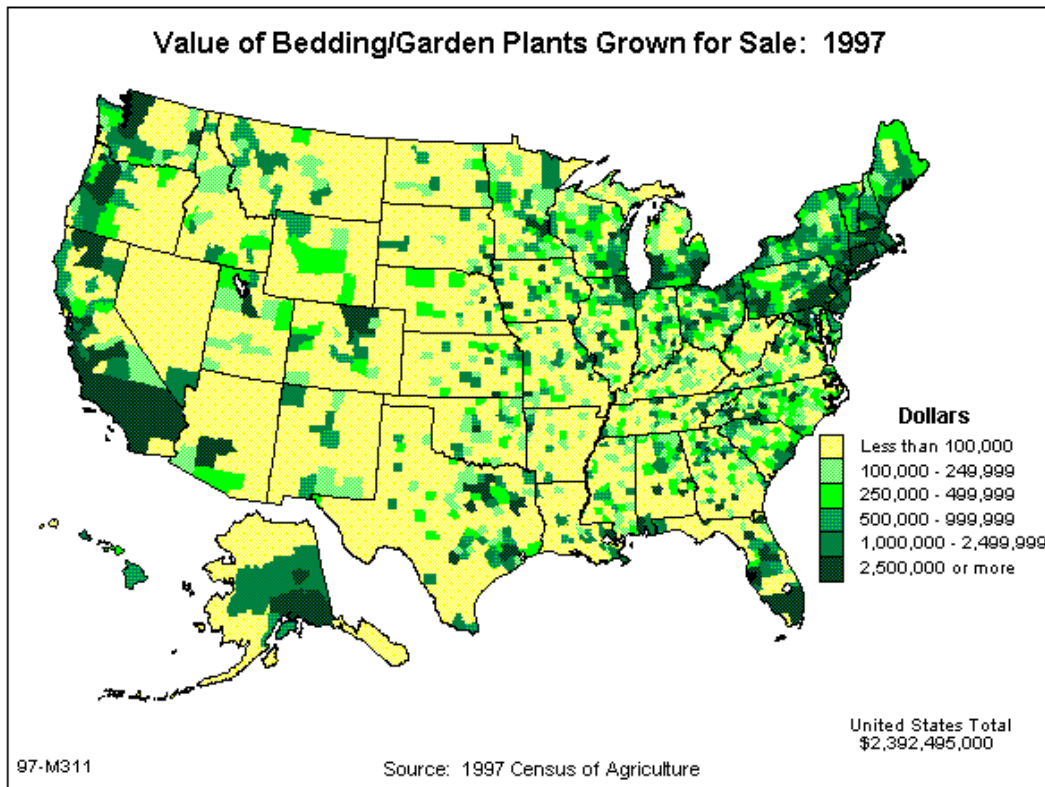
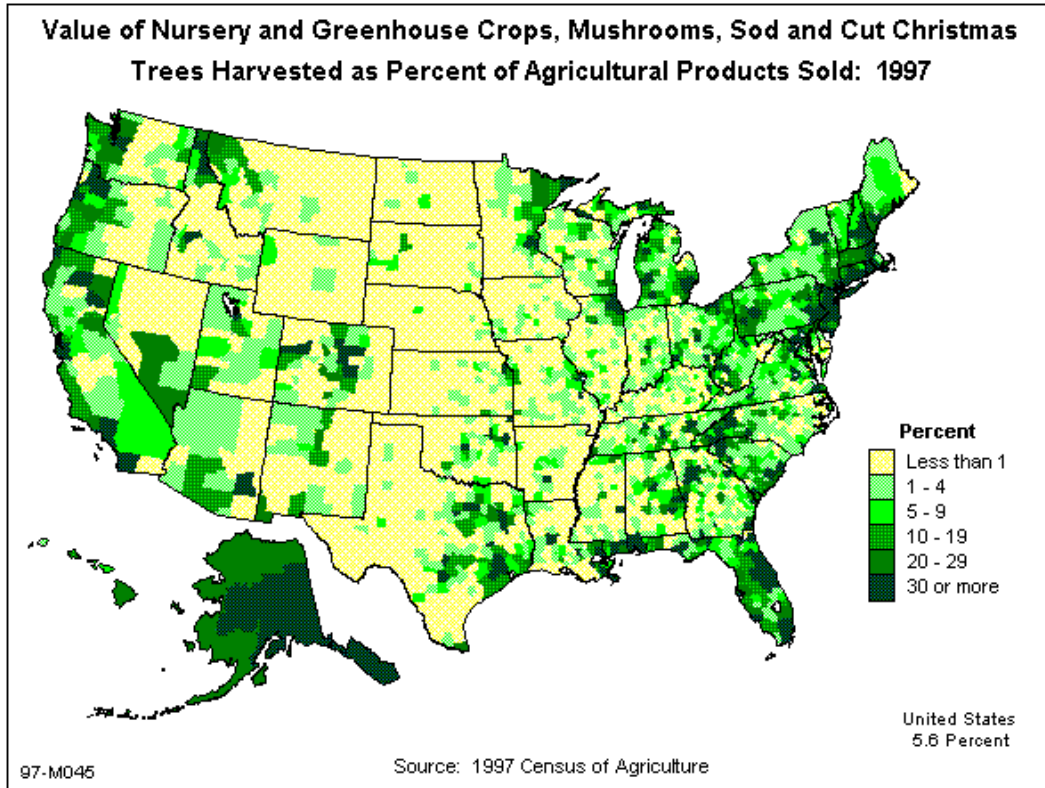


also contains some of most expensive farmland in the nation (see the map on Average Value Per Acre of Farm Real Estate, Jan. 1, 2000; available at <http://www.ers.usda.gov/Briefing/LandUse/Gallery/Value2.gif>). The different labor-to-land (and capital) ratios, as well as

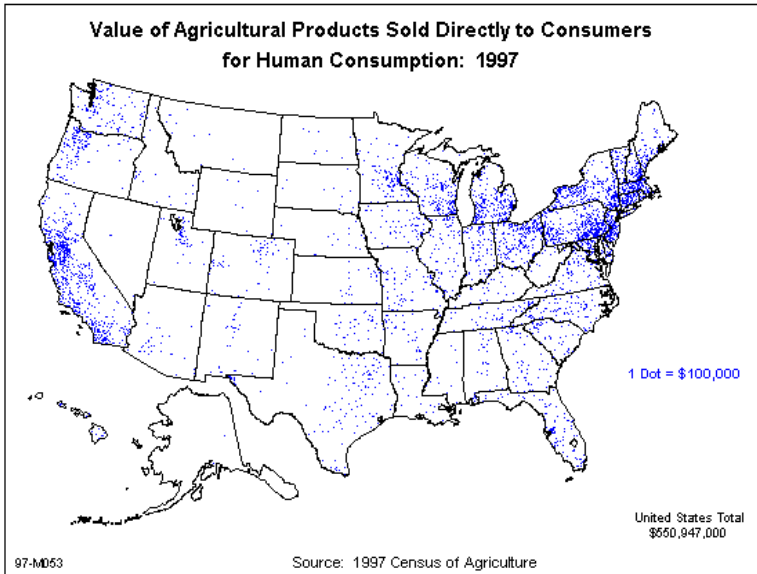
differences in the cost of land, in turn imply vastly different levels in the degree of efficiency with which the land resource is used. A county-level map showing the “Average Value of Land and Buildings Per Acre of Land in Farms: 1997” (not reproduced here; available at the USDA web-site) reveals higher values in counties that are either metropolitan areas or adjacent to metropolitan areas.

Thus, on the urban fringe, values of land and buildings per acre are higher than in more rural areas of the Northeast. A recent study suggests that, in the mid-Atlantic region, non-farm factors such as household incomes and population density have a stronger effect on farmland prices than farm-related factors, such as farm returns (Hardie et al., 2001). A similar study by the USDA finds a strong urban influence on farmland prices in the Northeast, but a lesser influence in other regions of the country.

Farmers in the NE region, especially on the urban fringe, grow high-value crops, including nursery and greenhouse crops, mushrooms, sod and cut Christmas trees as well as vegetables, sweet corn and melons (see map on next page). One of the effects of urban sprawl and new housing developments is to increase the demand for bedding and garden plants or shrubs; in particular, homeowners in new subdivisions tend to have a higher demand for these products than do homeowners living in established neighborhoods. From the map (Value of Bedding/Garden Plants Grown for Sale: 1997) on the next page, it is clear that agricultural producers in the Northeast and other areas with rapid sprawl take advantage of this fact.



One important way in which farmers can earn higher profits for their products is by capturing a larger share of consumers' food dollars. This can be accomplished by bypassing market intermediaries through direct sales to consumers. The map showing the Value of Agricultural Products Sold Directly to Consumers



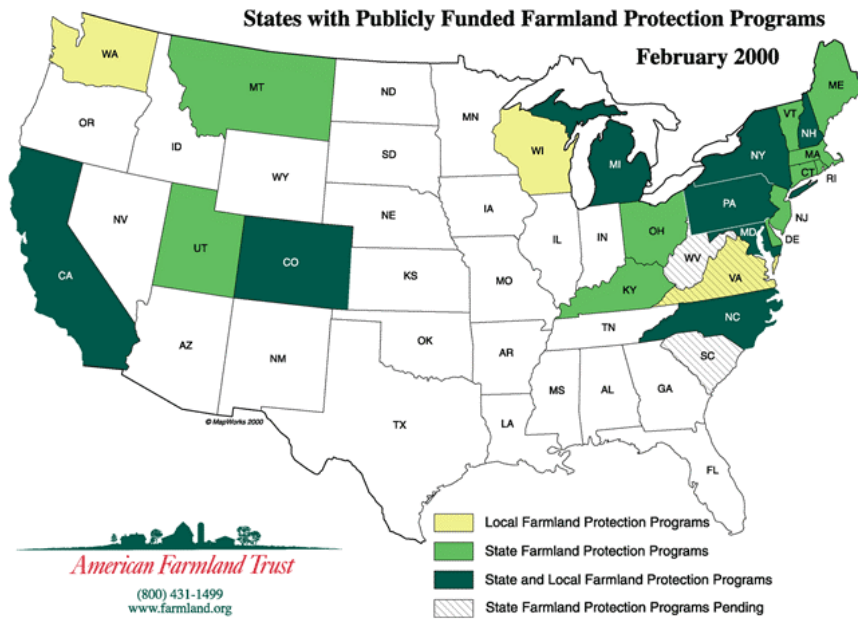
directly to Consumers for Human Consumption: 1997 suggests that agricultural producers along the Northeast seaboard around metropolitan areas also take advantage of this option. Massachusetts is a leading state nationally in direct marketing.

Efforts are currently underway in a number of Northeast states to improve the marketing of locally grown products to consumers. This includes promoting rural-urban food sheds and community-supported agriculture, and catering to the special needs of different ethnic groups. These groups are the fastest growing population segments in some areas of the Northeast, and savvy farmers can profit by growing and marketing ingredients for ethnic foods to them. Other entrepreneurs set up networks allowing local farmers to market fresh produce directly to upscale restaurants. All of these efforts raise the profitability of agricultural production and keep land in agriculture.

Agricultural Land Use Policy Issues

Unlike the top-down land use decisions common in Europe, many land use decisions in the US are made by local authorities. This phenomenon is even more pronounced in the Northeast US, where so-called *home rule* is commonly used. In the end, therefore, all land use decisions here are local.

Libby (2000, pp. 4-7) lists four types of policy instruments for protecting farmland, including tax incentives (for which there is little evidence that they are effective); rules as to who may own or operate farms (used mostly in Europe, and not in the US); purchases of the development rights to farm-



land; and regulations such as agricultural zoning.⁸ More generally, little is known about the relative costs and benefits of these different policy instruments. The Northeast US stands out in that all states (except for WV) have state and/or local publicly funded

farmland protection programs (available at: www.farmland.org/files/pace-colormap.gif).

Evidence is mounting that traditional agricultural commodity programs are not having the implicitly desired effect of keeping farmers in agriculture. A forthcoming study (Goetz and Debertin, 2001), among others, suggests that federal farm program payments actually accelerate – rather than retard – the movement of farmers out of agriculture. We estimate that the average US county lost 1 percent of its farmers (7 farmers) between 1987 and 1997 as a result of receiving around \$7,000 in program payments in 1997. This result is obtained after holding constant other reasons explaining why farmers cease to farm (such as advanced age or low farm income).

This raises questions about the desirability of continuing the existing system of farm support payments tied to commodities, relative to a new system that pays farmers for some or all of the public amenity benefits they provide. Within the WTO this notion is, of course, surfacing under the label of multifunctionality, for which relatively little enthusiasm exists to date in the US.

⁸ A conference to be held in Baltimore, MD in September 2001 (and co-sponsored by the NE Center) addresses the topic: Protecting Farmland at the Fringe: Do Regulations Work? Strengthening the Research Agenda.

Land Use Research Needs and Opportunities

Larry Libby (2001), C. William Swank Professor of Rural-Urban Policy at The Ohio State University, lists the following three research topics as top priority issues:

1. Estimating the economic value of non-food services provided by active farmland, including country-side amenities, groundwater recharge and wildlife habitat.
2. Analyzing the economic performance of alternative policy instruments for retaining land in farms (see above); costs include administrative costs and direct outlays; also consider distribution of cost among owners and taxpayers.
3. Explaining and predicting patterns of farmland conversion using various economic indicators of land value, institutional factors, and locational and spatial variables (work on this subject is underway at the Univ. of Maryland – Hardie, 2001).

Land use has significant impacts on individuals beyond those making the decisions about how the land is used (i.e., numerous so-called externalities are associated with land use); these include the environment (pollution runoff, hydrological impacts), ecology (habitat loss, climate change, biocomplexity), open space and aesthetics, congestion, provision of public goods, etc. (Bockstael, 2001). While little systematic information is available about society's collective preferences and willingness to pay for different land use patterns (as distinct from individuals' preferences for their own private property--Bockstael), Kline and Wichelns (1998, as cited in Libby, 2000, p. 2) "discerned three distinct sets of services desired [from farmland]—environmental (wildlife habitat, groundwater recharge, ecosystem protection), aesthetic (rural landscapes, scenic quality), and agrarian (farming as a way of life, local produce) in that order of priority."

In terms of natural landscapes, there is also evidence that individuals prefer a mixture of scenery (e.g., farmland interspersed with trees and lakes) instead of the same patterns repeated (such as only cornfields or evergreen trees) over space (Ready, 2000). This is clearly an area requiring further research, as is the willingness of the public to pay for different landscapes. European economists have a longer history of work on valuing amenity benefits of farmland and open space (Altobello, 2001) than many of their US counterparts.

An area of pressing research need is, therefore, whether the carrot (incentives which are locally established and voluntary or programs such as the CRP) or stick (regulatory, top-down zoning) approach is more effective in bringing about socially desirable land uses (Hardie, 2001; Seidl, 2001), and how they affect the behavior of landowners (Duke, 2001). In the Northeast in particular, a question arises about the costs and benefits of having many small, often part-time and volunteer units of local government make land use decisions.

Other specific questions that need to be addressed include (Goetz, 2000):

1. What is the extent of direct-marketing of agricultural products in different counties? Under which conditions is it especially profitable, and how does it affect farm survival rates and urban sprawl?
2. How do changing land use patterns affect the viability of local agriculture and, conversely, how does agricultural viability affect land use patterns?
3. What is the effect of land use regulations on economic development (for example, do stricter regulations retard economic growth and render poverty reduction policies less effective); conversely, what is the effect of different types of economic development on the propensity of communities to implement more stringent land use regulations.
4. What is the relationship between land use regulations and housing affordability in rural areas? By how much do different types of land use regulation or incentives change median housing prices? How do land use regulations affect the ability of the poor to live in their own homes?
5. How do local government officials obtain information about land use alternatives, and how do they choose among the alternatives available.
6. What are the distributional consequences of different land use regulations (see also Libby, 2001 above) and urban sprawl; who benefits and who loses under different programs? How does sprawl affect the flow of funds across jurisdictional boundaries.
7. What is “smart growth”? What lessons can be learned for farmland preservation strategies in communities that have implemented smart growth strategies.

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