

# Farmland Protection Programs and Rural Amenities

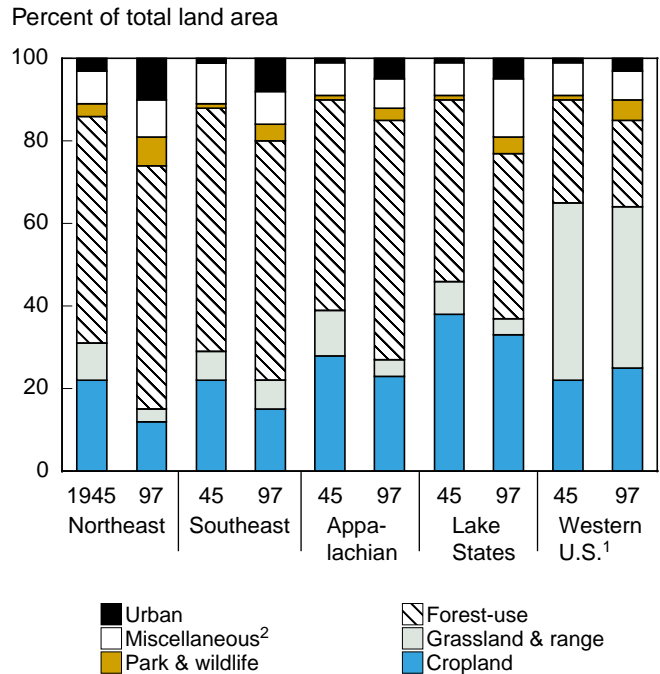
## The Loss of Farmland

Historical trends in land use tell a compelling story about the extent and location of farmland losses.<sup>4</sup> Figure 1 depicts land uses at two snapshots in time, 1945 and 1997, and reveals that cropland has decreased east of the Mississippi River, while remaining roughly constant in the Western portion of the Nation. Declines in rangelands and grasslands have occurred across the Nation during this period. Urban lands have increased everywhere, as have lands devoted to parks and wildlife. Figure 2, which depicts changes in cropland since 1945, clarifies that the greatest proportional losses in cropland have occurred in the Northeast, followed by the Southeast, Appalachian, and the Lake States. Figure 3 shows a similar pattern for urbanization, with the fraction of the landscape in urban uses increasing most in the Northeast. However, these trends mask agricultural land losses and increases in urban land at more local levels. As shown by the disaggregated perspective of figure 4, the heaviest urbanization between 1982 and 1992 occurred in the Northeast and the Lake States, with California, Florida, Texas, and Appalachian States also undergoing extensive urbanization.

As outlined in box on page 5, initial efforts in the late 1800s and early 1900s to protect non-urban lands were focused on the protection of forests and establishment of parks. By the 1950s, millions of acres of once clear-cut lands had regenerated into natural forests and were

<sup>4</sup> Words used to describe land often mean different things to different people or the same word might be used interchangeably with others to refer to the same concept. The Economic Research Service usually defines these terms as follows. Farmland - the Census of Agriculture definition of land in farms where a farm must have over \$1,000 of sales. Agricultural land - all land used for agricultural purposes including farmland and public land not included in the Census of Agriculture. Rural land - all land not in urban uses. Cropland - the ERS definition includes harvested cropland, summer fallow, failed cropland, cropland pasture, and idle cropland. Urban land - ERS generally uses the Census of Population definition, which includes residential, commercial, industrial, institutional, streets and roads, major airports, and urban parks. This should not be confused with the National Resources Inventory definition of urban, which includes a "built-up" category. These terms are further defined and explained in Vesterby and Krupa, 2001. A newer term, "working lands," is coming into wider usage, and includes forest land as well as agricultural land, and may also include environmentally sensitive land that "works" to clean the water and air.

Figure 1  
Land change, by region, 1945 to 1997

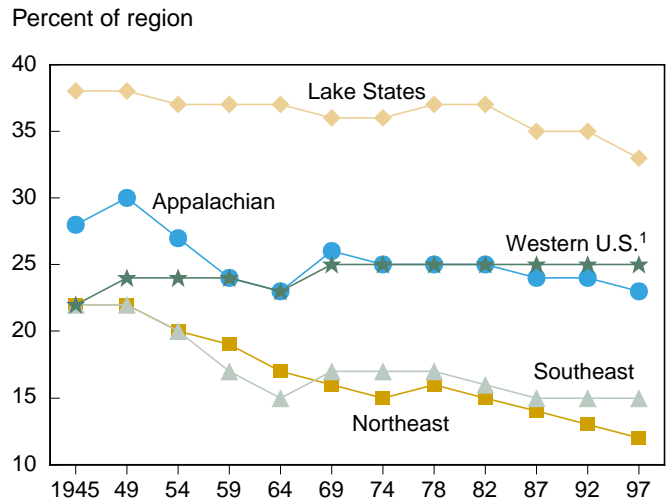


<sup>1</sup> Cropland gain regions include Northern and Southern Plains, Mountain, Pacific, Corn Belt, and Delta Regions.

<sup>2</sup> Includes rural-transportation, industrial, residential, marshes, deserts, and unclassified lands.

Source: Vesterby, M., and K.S. Krupa (2001). "Major Land Uses." (Database 1945-97).

Figure 2  
Percent of region that is cropland, 1945-97



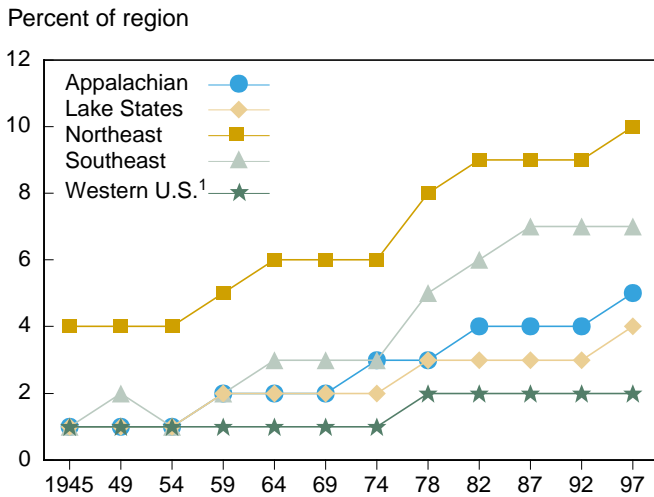
<sup>1</sup> Includes Northern and Southern Plains, Mountain, Pacific, Corn Belt, and Delta Regions.

Source: Vesterby, M., and K.S. Krupa (2001). "Major Land Uses." (Database 1945-97).

preserved through both national and State forest and park systems. In the post-World War II years the Nation's population increased significantly. Coupled with declines in household sizes, this contributed to

significant increases in the demand for housing (Heimlich and Anderson). Metropolitan areas expanded, and demand was also accommodated by low-density development in rural areas—sometimes at the expense of prime agricultural land.

Figure 3  
**Percent of region that is urban land, 1945-97**



<sup>1</sup>Includes Northern and Southern Plains, Mountain, Pacific, Corn Belt, and Delta Regions.

Source: Vesterby, M., and K.S. Krupa (2001). "Major Land Uses." (Database 1945-97).

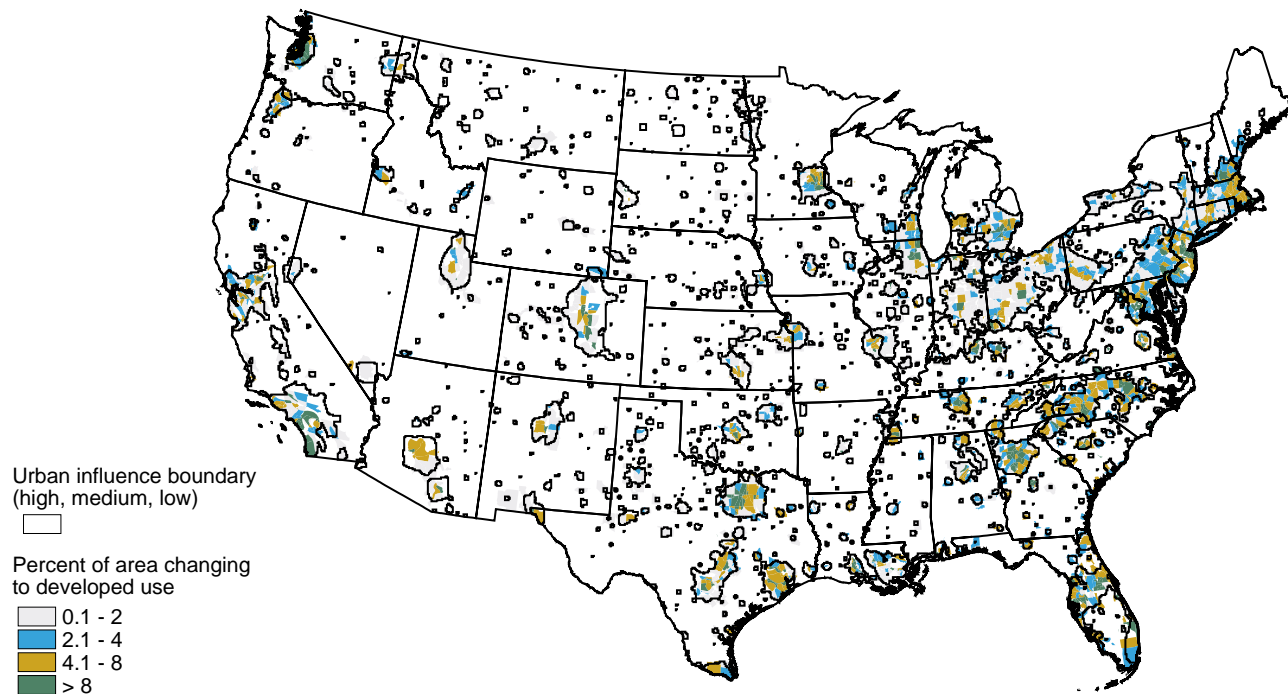
The historical trends paint a picture of an urbanizing America with farmland in decline across much of the Nation. This has contributed to mounting concerns about farmland losses. The popular press provides some evidence of the extent to which people care about these losses of farmland:

Consider the following:

◆ "Sprawl is claiming farmland at the rate of 1.2 million acres a year. Throw in forest and other underdeveloped land and, for net annual loss of open space, you're waving good-bye to more than 2 million acres" (Mitchell, *National Geographic*, 2001).<sup>5</sup>

<sup>5</sup> Many different estimates have been made of the rate of urban conversion. These range from about 0.75 million acres annually to 2.9 million acres, depending on the source and time period. ERS estimates urban conversion from all rural land, which includes everything not urban, at about 1.0 million acres per year. See: [http://www.ers.usda.gov/Emphases/Harmony/issues/arei2000/AREII\\_1landuse.pdf](http://www.ers.usda.gov/Emphases/Harmony/issues/arei2000/AREII_1landuse.pdf)

Figure 4  
**Comparison of estimated urban growth boundaries and percent of area changing to developed uses, 1982-92**



Source: Barnard, 2000. Note that about 15 percent of the Nation's 1 billion acres of farmland falls within urban influence boundaries.

## Preservation of Non-Urban Lands, With a Focus on the Northeast: 1800s-1960s

The historical backdrop of changes in land use helps form the context within which farmland protection policies are formed. For example, the Northeastern States offer an interesting perspective on the broad trends in American land use. Although most Northeastern States now have active farmland preservation programs, early State land preservation efforts were directed toward forests and parks.

From pre-colonial times until the early 1800s, the Northeast States were almost entirely covered with dense forest, with forest conversion occurring mostly to obtain firewood and to clear farmland. By 1850, demand for agricultural products to supply the coastal population centers and the need for timber and fuelwood, had led to the clearing of large areas of forest (Fredrick and Sedjo). Between 1800 and 1850, the area in agricultural use moved directly counter to the trend in forest acreage. These trends continued for the next several decades, leading to a four-fold increase in cropland acreage (Fedkiw). By the 1920s, about 384 million acres (40 percent) of the U.S. indigenous forest had been cleared (Fredrick and Sedjo).

However, several factors, such as the opening of fertile cropland in the Midwest, reversed the trends in both agricultural land use and

forestland use. Cropland expansion peaked in the Northeast in the 1880s, followed by abandonment of marginal farmlands and regeneration of natural forest (Fedkiw). Nationally, by the 1920s, the area of U.S. forests had stopped declining. In New England, forestland in 1980 had returned to levels substantially above those of the mid-1800s.

Along with broad changes in land-use patterns, the role of government in land management has evolved. Prior to the late 1800s, land policy had been one of transferring the “public domain” to State and private ownership (Fedkiw). However, the rapid demise of the forested area of the United States in the last half of the 1800s contributed to efforts to preserve and restore publicly owned forests and parks, both at the national and State levels.

Starting with Yellowstone (1872), by 1916 the concept of a system of national parks was established with the founding of the National Park Service (NPCA). Currently encompassing about 384 units covering more than 83 million acres (with most of these in the West and Alaska) the interest in these lands was largely from the perspective of preserving lands of extraordinary beauty and uniqueness. Somewhat paralleling the development of the

National Park system was the development of the National Forest system. Starting with the Forest Reserve Act of 1891, the National Forests system was established in 1907 (Clawson and Harrington). These National Forests accounted for 161 million acres by 1920, with 1.6 million acres located in four Eastern States. From 1920 to 1945, 22 million acres were added to the national forest, much of these in the East.

The concept of State parks also emerged near the end of the 19th century (Fedkiw). Although there were a few State parks established in the late 19th century (such as New York’s Niagara State Reservation in 1885) it was not until the 1920s that State park systems were broadly instituted. During the 1930s, some States incorporated tax delinquent lands, often cutover and abandoned forestland, into State forests. By 1950, there were 1,725 State parks, accounting for 4.7 million acres. Today, there are more than 12 million acres administered by State park agencies (NASPD).

More recently, Congress enacted the Land and Water conservation fund in 1964. Since then, 5.6 million acres of local, State, and Federal parks and recreation land have been acquired, largely near heavily populated areas.

- ◆ “Sprawl vaults to the top of concern lists in local polls” (Pierce, *Detroit Free Press*, 2000).
- ◆ “The importance of preserving DuPage County’s natural resources has been reaffirmed time and time again throughout the district’s 85 year history” (Pierotti, *Chicago Tribune*, 2000).
- ◆ “In California’s Central Valley, more than 12 percent of the farmland has already been paved over. If the current trend continues, the valley will lose more than one million acres of farmland by the year 2040, much of it on the best soils for growing crops” (Sanders, *California Country*, 1999).
- ◆ “If Maryland’s recent growth patterns do not change, development will consume as much land in central Maryland *alone* over the next 25 years as it has during the entire 368 year history of our State” (Glendening, 2001).
- ◆ “What Price Preservation? Some on Council Wonder—As Mayor John Delaney’s land saving Preservation Project finishes its second year, the city of Jacksonville can boast more than 16,000 acres that will never sport a rooftop, strip mall or smoke stack” (Rivedal, *Florida Times Union*, 2000).
- ◆ “In West Va., Getting Fairfaxed.” (Kunkle, *Washington Post*, 2001).

### ***Land Market Failures as a Reason for Farmland Protection***

Concerns over farmland losses have generated increasing support for farmland protection programs. To understand why government actions may be necessary to protect farmland, it is useful to consider the basics of rural land markets, and how rural land markets on their own can fail to provide socially desired quantities of land in agricultural uses.

Rural lands have many possible uses. For example, rural lands can be used as cropland (providing intensive production of food and fiber), or as forest and pastureland (providing less intensive production of food and fiber). Alternatively, rural lands can be developed (providing lots for homes and businesses).

Private landowners interested in maximizing the financial returns from their land will use land in a way that yields the highest possible returns. Characteristics such as land quality (e.g., soil fertility, slope, and permeability), surrounding land uses, and local population densities will help determine the highest returns land can generate. When land markets are *properly* func-

tioning, the price of land will reflect the value of land in its most profitable use. That is, land with a value in an agricultural use that exceeds all other use values will be farmed; whereas land with a value in a developed use that exceeds its agricultural use value will be developed. Doing otherwise would entail financial loss (or foregone opportunities for financial gain).<sup>6</sup>

*A properly operating land market* will fully account for all the goods and services that may be provided by a plot of land. This includes not only “marketable” goods (such as corn and developable tracts), but also the land’s contribution to providing a multitude of other outputs. As outlined in box on the next page, rural lands also provide a variety of “non-market” outputs that include food security, employment opportunities, aesthetically pleasing landscapes, wildlife habitats, agrarian cultural heritage, and recreational opportunities. Although these outputs may be important to the American population, the values of these outputs are not always reflected in the price of land when it is purchased or sold. When this happens, land markets fail to operate properly or efficiently.

This failure happens because farming generates *externalities*:

- ◆ *Positive externalities* are products that are valued by society, but for which the farmer receives no direct monetary return. Examples include scenic views and the farmland’s contribution to maintaining a community’s rural character.
- ◆ *Negative externalities* are unpleasantities that the farmer does not have to pay anyone to accept. Examples are the erosion and unpleasant odors that a farming operation may produce.
- ◆ As explained in the box on p. 8, positive and negative externalities generally have a *non-market, public goods* nature.
- ◆ Since the value of externalities is not reflected in the market value of land, landowners have little incentive to consider these non-market public goods when managing their land.<sup>7</sup>

<sup>6</sup> The actual usage of any given plot of land will reflect idiosyncratic factors, which explains locales with a mixture of land uses. For example, especially fertile farms may stay in agriculture while their neighbors develop, or a farmer who greatly prefers his agrarian lifestyle may hold onto his land even when offered substantial dollar sums. Conversely, farms located in easily accessible locations, or held by farmers nearing retirement, may be sold to developers at the earliest opportunity.

<sup>7</sup> Appendix 1 outlines the economic logic addressing this problem of the private provision of public goods.

## Non-Market Outputs from Agricultural Lands

In addition to crops and other marketed outputs, a variety of other “non-market” outputs can be produced on agricultural lands. These include:

### Positive

#### *Environmental\**

- ◆ Open space
- ◆ Soil conservation
- ◆ Biodiversity
- ◆ Wildlife habitat
- ◆ Recreational opportunities
- ◆ Scenic vistas
- ◆ Isolation from congestion
- ◆ Watershed protection
- ◆ Flood control
- ◆ Groundwater recharge

#### *Rural Development*

- ◆ Rural income and employment

- ◆ Viable rural communities
- ◆ A diversified local economy

#### *Social*

- ◆ Traditional country life
- ◆ Small farm structure
- ◆ Cultural heritage

### Negative

- ◆ Odor
- ◆ Nutrient/pesticide runoff
- ◆ Soil erosion
- ◆ Ecosystem fragmentation

\* Note that the value of several of these outputs depends on the alternatives. For example, agricultural lands may offer better wildlife habitat, more biodiversity, and a greater degree of watershed protection than urban lands, but may provide fewer of these services than forestland.

Consider a farmer who operates a dairy farm. The farm has a farmhouse, dairy barn, a feed silo, pasture for the dairy herd, and land devoted to row crops. One of the positive externalities provided by this farmer is “a pleasing pastoral panorama,” which urbanites enjoy when they take weekend drives through the country. However, the farmer is not compensated for providing these scenic views (since it is not possible to exclude any passerby from enjoying the view for free). Lacking any means of receiving compensation for providing this “pleasing pastoral panorama,” landowners will not consider the societal value of providing this beneficial good when managing the land.

In particular, missing in the farmer’s calculations as to whether to sell the land is the value of the pleasing pastoral panorama that the farm provides to neighbors and to sightseers, a value that will be lost when the land is developed. Thus, because “pleasing pastoral panoramas” and other amenities are not valued in private land markets, farmlands may be prematurely converted to developed uses even though society

would prefer to have them remain in agriculture. This happens because the land will be converted when its development value (the revenue from selling the lands as housing lots) exceeds the agricultural value (the expected revenue stream from continued dairy operations), without considering the value of the rural amenities produced by the farmland.

Since rural lands can produce positive externalities, and since private markets fail to adequately account for the value of these non-market public goods, then as a society we are potentially better off when the government intervenes to correct this failure.<sup>8</sup> Despite well-known problems with designing and implementing government programs to provide public goods (as described in Appendix 1), the use of farmland protection programs is one means of ensuring the continued flow of non-market goods provided by agricultural lands.

<sup>8</sup> Similarly, society is potentially better off when the government intervenes to alleviate negative externalities, such as by mandating or subsidizing environmentally sensitive management practices.

## Externalities, Non-Market Goods, and Public Goods

Many rural amenities are positive externalities generated by agricultural lands that have a public goods nature. In this box we define these terms.

Economists use the term **externality** to describe a harmful or beneficial side effect that occurs in the production, consumption, or distribution of a particular good. Externalities affect the well-being of others in a way that is not transmitted by market prices. For example, farming can cause negative externalities (such as sedimentation of streams) that the farmer does not have to pay for, and positive ones (such as scenic landscapes) for which he receives no compensation. Since the costs (or benefits) of externalities are

not reflected in the market, economists classify externalities as non-market goods.

**Public goods** are distinguished from the more familiar private goods by *nonrivalness* and *nonexcludability* in consumption. Nonrival means that one person's consumption (enjoyment) of the good or service does not diminish another person's enjoyment of the same product—the good is not used up by individual or even multiple consumers. In contrast, with a private good, one person's enjoyment of the product (say a candy bar) forecloses the possibility of a second person's enjoying the same item. Nonexcludability means that once produced, anyone can enjoy the good—the producer cannot limit access to the good. With private

goods, the consumer must purchase the good from the producer.

Markets do not work well with public goods; there is no incentive for consumers to pay for the good, and entrepreneurs cannot selectively withhold the good as a means of countering nonpayment. That is, once an entrepreneur provides the good for one consumer, it is available to all. Given that consumers have no incentive to pay, private firms will not be motivated to supply the good.

Summarizing, externalities and public goods are examples of non-market goods. Moreover, rural amenities are frequently public goods that are generated as externalities of agricultural production.

### Farmland Preservation and Rural Amenities

It is useful to classify the goals served by farmland protection programs into several broad categories:

- ◆ Ensuring orderly urban development (the prevention of sprawl)
- ◆ Maintaining agricultural production (protecting local and national food security)
- ◆ Supporting the agricultural economy (creating employment opportunities and supporting rural businesses)
- ◆ Protecting environmental services (pollution reduction and natural resource protection)
- ◆ Providing rural amenities (scenic views, agrarian cultural heritage, etc.)

In this report we consider the latter two items (environmental services and rural amenities), and give special attention to the provision of rural amenities from agricultural lands. We adopt this focus because:

- ◆ It is unclear whether farmland protection programs will have any significant impact on national

food security, or do much for beleaguered rural communities:

- Despite what may seem to be alarming trends in farmland loss, the United States has an abundance of agricultural lands (Heimlich and Anderson, Vesterby and Krupa, Vandell and Malpezzi). Conversion of farmland to other uses is small relative to this base, and there is little evidence to suggest that our Nation faces any long-term threat to productive capacity.
- In some locales the agricultural economy may be fragile, and government involvement may help maintain both jobs and related businesses. However, it is likely that these effects are small, and may be addressed without interventions in land markets (Gardner).
- ◆ The protection of local food security is a variant of both these concerns. Barring a massive breakdown of the Nation's transportation infrastructure, this is not likely to be a serious problem.
- ◆ Many rural amenities exhibit the characteristics of public goods, and (as discussed in the previous section) are likely to be ignored by the normal workings of land markets.

- ◆ While receiving some attention (Heimlich and Anderson), the relative importance of rural amenities provided by farmland protection programs is still an open question.

Broadly defined, rural amenities encompass a variety of goods that require a rural setting and that cannot be reduced to a transfer of a commodity. Two salient features underlie this broad definition: “rural settings” and “non-market” goods.

Rural settings refer to lands that begin at the city’s edge.<sup>9</sup> Agriculture is an example of a land use one would find in a “rural setting.” Since a “city’s edge” is often not sharply delineated, the term “rural settings” is meant to be suggestive of landscapes defined, but not dominated, by a human presence.

The “non-market” feature refers to the value of an amenity as a function of things that are not reflected in its market price. In the case of rural amenities, value is derived from where it is produced and consumed. The rural amenity “good” or “service” depends on the fact that a rural landscape was involved in its production. Thus, a bushel of corn usually lacks this feature—the value of corn is derived from the nutrition and flavor of the corn, and generally not in where or how it was produced (except in that it may affect the qualities of the corn). Conversely, the benefits derived from rural amenities (such as scenic views) are inherently linked to a rural landscape.

In fact, enjoyment of rural amenities may not even require a tangible experience: the mere existence of a rural setting may be of value. For example, the knowledge that our Nation’s farming heritage is being maintained, that the sturdy yeoman farmer ever yet tills the soil, may be of value to many people in an otherwise urbanized society. Again, this value does not flow from the foods and fiber provided by this industry, but from the “where” (and by whom) this effort takes place.

Note that the division between “rural amenities” and the other four goals is not necessarily hard and fast. For example:

- ◆ The creation of employment opportunities reflects the normal workings of the market economy. Yet many people, even those not looking for a job, feel

<sup>9</sup> In the United States it is useful to add another boundary—where the wildlands begin at the edge of rural settings.

better about a society where there is an abundance and variety of employment opportunities, including employment opportunities in rural areas. In that sense, employment opportunities have a non-market component.

- ◆ People often value unique aspects of locally produced farm products, a preference that may be difficult to capture in food markets. In such cases, farmland protection for “productive reasons” can be considered to be a case of “providing a rural amenity.”
- ◆ Environmental services can often be considered to be rural amenities. However, the connection to farmland protection is less clear—since environmental services can often be modified without changing land uses (say, by more careful farming practices). Although the same can be true of rural amenities (some rural lands provide more amenities than others), the link between rural land uses and rural amenities is stronger than that between rural land uses and environmental services.

Given the broad criteria outlined above, rural amenities encompass a wide array of goods. A number of economists have considered the issue of what constitutes rural amenities:

- ◆ Crosson (1985) placed strong emphasis on the importance of the intangible outputs provided by rural amenities, including spatial benefits, wildlife and scenic habitats, agrarian fundamentalism, and the sense of identifiable community. He also noted the importance of the rural scene as a future base for residential and commercial development with its attendant association with employment benefits provided by the rural sector.
- ◆ Gardner (1977) pointed out the importance of local and national food production, local jobs derived from the agricultural sector, and the need for more coordinated use of both rural and urban land uses. He also discussed the benefits of environmental amenities, which include open space and environmental and natural public goods.
- ◆ Halstead (1984) placed major emphasis on the importance of non-market elements such as wildlife habitat, scenic views, and recreational benefits. Beasley et al. (1986), while accepting previously known and identified benefits, emphasized irreplaceable scenery and historic significance in explaining U.S. cultural development. Bowker and Didychuk (1994) cited the importance of open space

## Policies for Protecting Farmland

Agricultural support laws can be viewed as forms of farmland preservation to the extent that they seek to help farming remain financially viable in an increasingly urban and suburban American landscape. The following terms define several land-use planning techniques and policies with a farmland preservation focus.

### **Agricultural conservation easements**

Agricultural easements involve the placement of permanent or long-term restrictions on individual parcels that prohibit future suburban or urban development. While retaining full ownership in all other respects, landowners voluntarily give up their development rights, and in return receive an economic benefit—cash (including cash equivalents) or an income tax deduction, or a combination of the two. The three methods for acquiring easements are:

#### **1) Purchase of development rights (PDR)**

PDR programs, also known as “purchase of agricultural conservation easements” (PACE) programs, involve direct compensation to the landowner for the value of the development rights. The value of development rights is typically calculated as the difference between the market value of the land

and its value for farm production. Some programs pay the lower of the estimated value of the development rights or the amount at which the landowner offers to sell the rights.

#### **2) Donation or charitable contribution**

This strategy involves an outright gift by the landowner of the development rights to the preservation agency, resulting in a Federal (and in many cases, State) income tax deduction.

#### **3) Transfer of development rights (TDR)**

TDR programs result in preservation by allowing landowners (in designated “sending areas”) to transfer the development rights to an area where urban growth is desired (“receiving areas”). Developers purchase the TDRs and use them to develop at densities higher than what is allowed by the underlying zoning in receiving areas. Sellers and buyers negotiate the sales

price of TDRs privately. A TDR arrangement may be a condition imposed on new development, and the developer carries the cost of acquiring the rights from an agricultural landowner.

### **Agricultural districts**

Several States allow farmland owners to form agricultural districts in designated areas. Once enrolled in a district, the landowner agrees to maintain the land in an agricultural use for a minimum number of years, after which the landowner can withdraw his land from the district. District status can provide insulation from nuisance complaints of normal agricultural activities and property tax credits in some areas. Also known as agricultural preserves, agricultural security areas, agricultural incentive areas, agricultural development areas and agricultural protection areas.

*Continued on page 11*

and scenery, and also stressed the significance of a blend of wildlife and traditional country living. Similarly, Duffy-Deno (1997) dealt at length with scenic beauty and open space.

- ◆ Rosenberger and Walsh (1997), like the previous authors, stressed the traditional values of open space such as visual effects and recreation, but also stressed the therapeutic benefits of rural amenities. They also emphasized fundamental environmental amenities such as soil and water conservation provided by watershed protection; as well as the preservation of irreplaceable plant and animal habitat and biological diversity. Kline and Wichelns (1996) placed a strong emphasis on environmental

quality based on natural places, wildlife habitat, and the importance of the maintenance of groundwater quality. They also stressed the importance of farming activity and local food production.

- ◆ Bergstrom (1998) provided a complete listing, stressing the significance of an area as a place to live, work, and play. He emphasized the role of recreation, the importance of space, and a lack of congestion. He placed in the next most importance priority habitat and the general environment (including topographical features). He also addressed the interrelationships between these amenity features and natural water supply systems controlling water quality and quantity.



Continue from page 10

### **Agricultural protection zoning**

Agricultural protection zoning is intended to segregate agriculture from other land uses. The zoning is based on minimum parcel size, and limited allowable use discourages sales for other uses and restricts uses to farm-related activities (farm family and labor housing, processing, and marketing). Some jurisdictions provide a range of agricultural zones, ranging from “exclusive” to other categories that allow a mixture of uses including “hobby” or noncommercial farms and large-lot residences.

### **Preferential or differential assessment of farmland**

All States have enacted preferential (or differential) tax assessment laws related to agricultural land. Preferential assessment laws (also known as current use assessment, current use valuation, farm use valuation, use assessment, and use value assessment) direct local governments to assess agricultural land at its value in current agricultural uses, instead of its full market value

for potential urban (developed) uses, which, near cities, is generally much higher. The intent of these laws is to remove a disincentive for conserving farmland in the face of development pressure. Taxation at preferential assessment rates is often offered to farmers in exchange for agreement not to develop for some time period. Repayment of accrued tax reductions (called rollback provisions) can be imposed if the land is developed before the end of the agreed term. Wisconsin and Michigan use preferential assessment, but provide the benefits to farmers indirectly through State income tax reductions.

### **Right-to-Farm**

All States have enacted right-to-farm legislation. Right-to-farm laws are meant to provide farmers with protection against nuisance lawsuits brought by new, urban-oriented neighbors objecting to normal farm activities, and sometimes against local-government-imposed ordinances that unreasonably restrict agricultural activities. Some right-to-farm laws require that notices be attached to deeds of all proper-

ties in protected agricultural areas. The notices serve as cautions to potential residential and recreational land buyers that the property may be subject to dust, odors, noise, and other inconveniences associated with location near farm operations. Further, such disamenities occur even when farm operations are using generally accepted (agricultural) management practices and also are otherwise in compliance with Federal and State laws.

### **Urban growth boundaries**

Urban growth boundaries are planning boundaries that identify the outer limits of an urban area’s long-term growth. Usually designed as rings around central cities or other urban concentrations, the boundaries seek to slow down growth, encourage compact and efficient developments, steer more development to established urban neighborhoods, reduce the cost of public services, and preserve natural resources. Farmland protection is at least a secondary purpose of this technique.

*Source:* American Farmland Trust, Daniels and Bowers.

- ◆ Mullarkey, Cooper, and Skully (2001) summarized some multifunctional and welfare-enhancing amenities, and possible disamenities, produced from agricultural lands. Important environmental/social benefits associated with agriculture are scenic vistas, traditional and historic country life experiences, wildlife habitats, small farm structures, flood control benefits, and the enduring presence of a cultural heritage. On the more quantitative side, rural developmental and food security features include supporting rural employment and income, eliminating hunger, maintaining viable rural communities, and guaranteeing a safe and secure food supply.

Figure 5 summarizes a variety of rural amenities and orders them in terms of dependence on the presence of agricultural activities in a rural landscape. At one end are goods and services that may be produced in rural landscapes, but do not require active agriculture. We classify outdoor recreation at this end of the spectrum.<sup>10</sup>

<sup>10</sup> In fact, “rural” settings may not be necessary; city parks can provide outdoor recreational opportunities as can wildlands.

Figure 5

## Rural amenities produced by farmlands

Agrarian cultural heritage includes: *knowing that the rural character of the land is being maintained, and knowing that farming as a way of life continues in your community.*

Rural pleasantries include: *walks in pastoral settings, scenic drives in the countryside, and visiting local farms.*

Support for rural communities includes: *a diversified rural economy, and viable rural communities.*

Recreational opportunities and environmental services include: *fishing, swimming, birdwatching, biodiversity, watershed protection, and flood control.*

Requires active local agriculture

axis of need for active local agriculture

Does not require active local agriculture

*What about local food security?* Local food security is enhanced by extensive local agriculture. However, it can also be supplied by more intensive use of fewer acres, or by reliable inter-regional markets in food products.

“Local food security and quality”<sup>11</sup> and “supporting rural communities”<sup>12</sup> lie in the middle. The other end includes goods that are intimately tied to agricultural landscapes, in the sense that these goods would have little value (or be difficult to produce) without agriculture. We place “rural pleasantries” and “agrarian cultural heritage” at that end of the spectrum.

Note that our use of the term “rural pleasantries” incorporates the kinds of enjoyable features of the rural landscape that many people may think of when casually using the term “rural amenities.” That is, we define rural amenities more broadly, a definition that incorporates rural pleasantries along with a variety of other goods and services.

Although the above discussion is framed in terms of agriculture, the rural landscape contains several other broad categories of land types, including

- ◆ woodlots and commercial forestlands;
- ◆ rural parks;
- ◆ natural resource areas (such as wetlands); and
- ◆ rural communities.

<sup>11</sup> Of course, local food security, and local food quality, may be strongly correlated with the extent of agriculture. However, intensive use of farmland, reliable inter-regional trade, and industrial food production technologies (such as hydroponics and greenhouses) all provide alternative means for ensuring local food supplies in the face of a decline in farmland acreage.

<sup>12</sup> Rural communities can be supported in a number of ways, such as creating roads and other public works, developing non-agricultural sources of employment, and supporting agriculture.

Each of these land types also produces some rural amenities similar to those produced from agricultural lands. For example, “open space” can be provided by rural farmlands and by rural forestlands. Although in this paper we focus on agricultural lands, in several sections (such as in the case studies), we place our findings concerning farmland protection programs within the broader context of the multiplicity of rural lands. This exercise helps explain the emphasis of existing farmland protection programs. Depending on the value people place on specific rural amenities, the most cost-effective use of the rural land protection dollar may or may not be to spend it on maintaining land in agriculture.

## Farmland Protection Programs

Since the advent of farmland protection programs in the 1960s, the suite of farmland programs has steadily broadened. As explained in the box on pages 10-11, farmland protection programs range from zoning to purchase of development rights. The adoption of farmland protection programs has followed a general progression across this range. The initial policy often is agricultural/rural residential zoning, which is a regulatory approach mainly intended to isolate incompatible land uses and to limit the density of residential development (Solberg and Pfister). Since zoning is often viewed as ineffective or as unfairly infringing on landowner rights (Whyte), a second generation of policies relies upon increasing the economic viability of agriculture. The prime example is differential assessment (some form of which exists in all 50 States), which mandates

that farmland be taxed at its agricultural value rather than its developed value. When this economic incentive is viewed as insufficient,<sup>13</sup> a third generation of programs combines tax relief with the creation of regions in which agriculture is the preferred and protected use. These include the formation of agricultural districts, the passage of right-to-farm laws, and designation of urban growth boundaries.

Since these additional benefits are often insufficient to offset the revenue available to the landowner from development, another generation of policies was devel-

<sup>13</sup> Differential assessment programs may impact the *timing* of development. Given that the tax savings are small relative to the opportunity cost of delaying development, the likelihood that such an incentive will succeed in completely withholding land from development is small.

oped in which the development rights are severed from the fee-simple bundle of ownership rights, permitting the agricultural land base to remain intact. These programs, often called Purchase of Development Rights (PDR) or Purchase of Agricultural Conservation Easements (PACE) programs, place a conservation easement on the deed that prevents non-agricultural development into perpetuity, but compensate the landowner for the forsaken property rights. In particular, PDR programs allow the government and other organizations to obtain a “partial interest” in the land (Wiebe). The government (or private organization) can then extinguish development rights to agricultural lands, with the private landowner retaining all other rights, including the right to continue farming. As detailed in the box on this page, in recent years, the Federal government has begun to help fund State and local PDR programs for both forest and farmland.

## Purchase of Development Rights in Federal Programs

The Federal Government has a long history of supporting domestic rural land conservation programs. Most of these programs have involved cost-sharing with farmers to encourage conservation practices and the idling of environmentally sensitive cropland (see Claassen et al. for a review of Federal rural land conservation programs). However, in recent years the Federal Government has become involved with the preservation of the uses of rural lands, especially farmland and forestland. In particular, the U.S. Forest Service’s Forest Legacy Program (FLP) and the Natural Resources Conservation Service’s Farmland Protection Program (FPP) are designed to preserve land uses through the purchase of development rights.

The FLP program purchases development rights with the dual aims of “promoting effective forest land management and protecting the land from conversion to non-forest uses.” Priority is given to lands that possess important scenic, cultural, and recreation resources. The FLP, first created in 1990, is active in over 22 States. As of November 2001, approximately 113 projects covering 209,000 acres have been completed, involving a contribution from the FLP of about \$50 million (<http://www.fs.fed.us/cooperativeforestry/flp.htm>).

The Federal Farmland Protection Program (FPP) was established in the 1996 FAIR Act to provide funding to State, non-government organizations (NGOs), local

governments, and tribal entities that have existing farmland protection programs (<http://www.info.usda.gov/nrcs/fpcp/fpp.htm>). The FPP provides up to 50 percent of the fair market value of the conservation easement on privately owned farmland. Funded in several waves since its inception, as of December 2001 the FPP had spent approximately \$50 million to protect about 107,000 acres of land (on about 540 farms) that have a total easement value of about \$190 million. The 2002 Farm Security and Rural Investment Act (the Farm Bill) greatly expands funding for the FPP, allocating approximately \$100 million per year over the next 6 years for the program. (<http://www.nrcs.usda.gov/programs/farmland/2002/index.html>).

## The Overall Demand for Farmland Protection

In this section, we consider what determines the overall level of government protection of agricultural lands. Taking a broad perspective, the advent and continuing popularity of farmland protection programs can be viewed as a logical response to the locally diminishing supply of farmland and, hence, of the rural amenities provided by farmland. Figure 6 illustrates this story. Consider an urban State and a rural State. In both States there is a market-driven amount of land devoted to farming ( $S^e_U$  and  $S^e_R$ ), an acreage defined by those lands where agriculture represents the most profitable use. Essentially, these farm acres provide local residents with a quantity of rural amenities “for free.” Furthermore, assume that the next most profitable use of land is in a developed use.

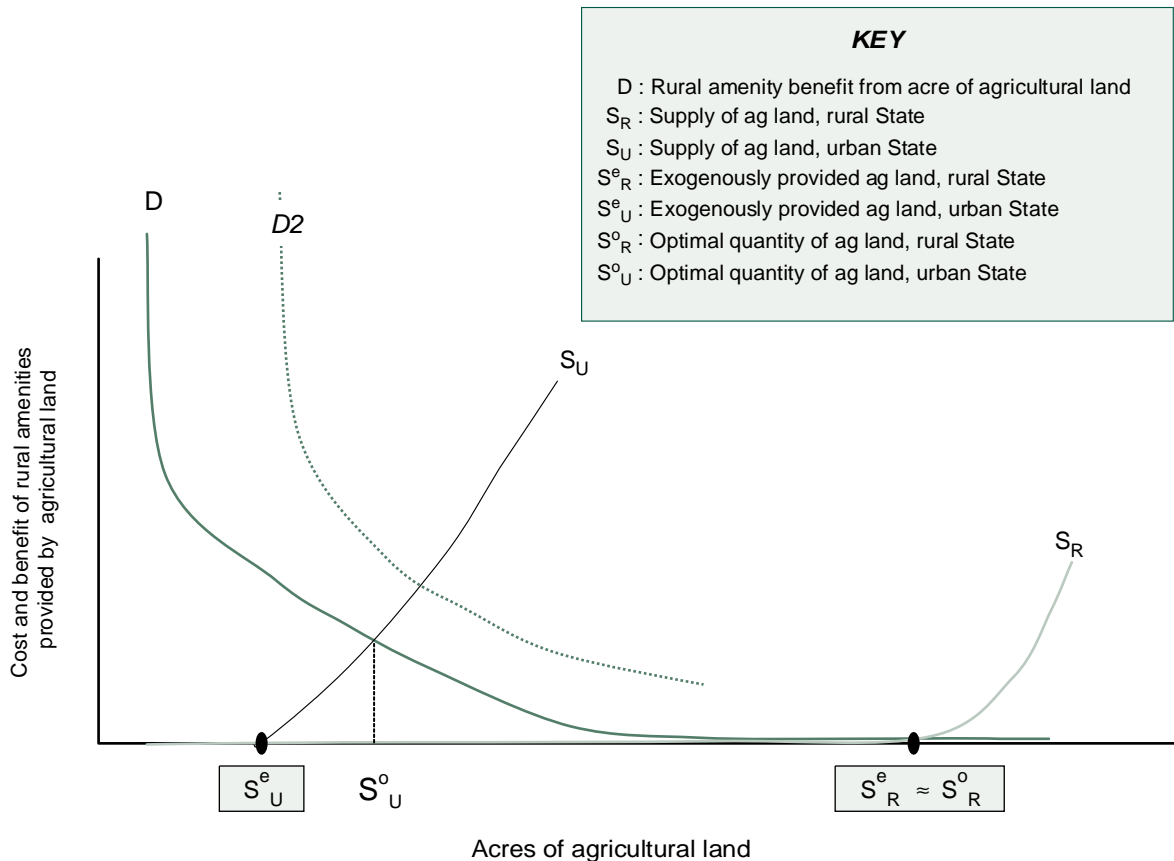
To induce profit-maximizing landowners to provide more than the market-determined acreage of agricultural land, farmland owners would require an additional infusion of money to compensate them for continuing to farm when it would otherwise be prof-

itable for them to develop. In the urban State, agricultural land is scarce, and there are many competing uses for farmland. Thus, the cost of providing more rural amenities (by providing an additional acre of farmland over and above the market-derived equilibrium) becomes non-zero at a relatively low acreage.<sup>14</sup> In the rural State, farmland is abundant, hence the cost becomes non-zero at a large acreage. These differences are illustrated in the two supply curves: in the rural State, it is shifted to the right.

The optimal acreage of farmland is determined by where the demand curve for rural amenities intersects the respective supply curve. Here, curve D represents the aggregate demand for rural amenities. In the urban State, this intersection occurs at an acreage that is greater than the amount of agricultural land that is provided by the freely operating land market. Conversely, in the rural State, this intersection occurs at (or very near) the market-driven acreage. Essentially, residents of the rural State are satiated

<sup>14</sup> The cost is the “additional compensation” required to induce a farmer to continue (or to increase) his farming.

Figure 6  
The demand for farmland protection: Rural vs. urban states



with rural amenities, and have little desire to acquire more rural amenities than are provided by the normal workings of the land market.

In short, the high marginal value of rural amenities (a value due to scarcity) in the urban State means that people would be willing to pay a lot more to protect additional farmland than in the rural State. This stylized fact helps explain why we see more energetic farmland protection programs in urbanized parts of the Nation (such as the East). In fact, given the higher population densities of urban States, and given the public goods nature of many rural amenities, it is likely that the true urban demand will be shifted up (as represented by curve D2), which will further increase the divergence between urban and rural States.

It is not surprising that a diminishing supply of farmland is likely to lead to greater efforts to protect what remains. However, this may be just one of several factors that are important in determining a community's decision to engage in farmland protection. For example, one can postulate (as did Adelaja and Friedman) that wealthier communities have the necessary financial and social resources to afford farmland protection.

To shed some light on the underlying motivations for farmland protection, we developed an econometric model using data from several Eastern States (see Appendix 2 for details). The first part of the model considers influences on the decision to adopt PDR programs. The second part examines the amount of land preserved in a county given that the county has a PDR program.

Our findings support several hypotheses:

- ◆ “Wealthier communities will protect farmland.” This is supported by the importance of an income variable.
- ◆ “Protecting what farmland is left.” This is supported by the positive correlation between land preservation and population pressure, increases in population pressure, and reductions in quantity of farmland found in the model.
- ◆ “Availability of farmland.” This is supported by a positive relationship between remaining farmland and farmland preservation.

It is not surprising to find support for these hypotheses, since these factors are inter-related. As farmland is developed, the average income levels of a given county likely rise. These factors contribute to a demand for

farmland protection. At the same time, it is easier to protect farmland when much of it is available for preservation. All of these factors taken together help explain the existence and activity of these programs.

Yet what are the underlying reasons motivating the desire to protect farmland? That is, just what rural amenities and other non-market goods are being maintained? To try to discern the answer to this question, a more careful analysis of farmland protection programs is called for, one that goes beyond simple measures of whether a program exists, or what the size of a program may be.

## Preferences for Rural Amenities

Because a single commodity known as “rural amenities” does not exist, effectively providing rural amenities is not as simple as determining how much farmland to protect. Farmland protection programs designed to maintain rural land uses differ in how they maintain the supply of the various goods (and services) that one may call rural amenities, with different programs affecting each of these goods in different ways.

It is not always obvious which rural amenities the public attempts to protect when they choose to preserve farmland and other rural open spaces through the legislative process.<sup>15</sup> As noted earlier, activities focused on preserving farmland, and other rural lands, protect a *bundle* of nonmarket goods associated with rural uses of land. What are the most important attributes in this bundle? Is it visual landscape aesthetics, less congestion on rural roads, supporting local growers, or something else? Should efforts to preserve farmland focus on preservation of the economic activity called farming or only on the preservation of the open space associated with uncluttered (and, perhaps, even agriculturally idle) rural land?

One approach is to ask people what they think farmland preservation programs should protect. Table 1 summarizes the findings of a number of such studies. Although most of this work has dealt with the question of how much farmland to protect, rather than the reasons for protecting farmland, several studies have addressed the questions of the relative value people place on different rural amenities.

<sup>15</sup> Along with rural amenities, the public may also be interested in goals such as food security and the control of sprawl.

**Table 1—Summary of several surveys on public attitudes toward farmland protection**

Authors	Region	Findings
Halstead (1984)	Hampden County, MA	There are strong preferences for protecting remnant farmlands, that increase with size of program, and seem to be positively influenced by the proximity to farms.
Furuseth (1987)	Mecklenberg County, NC	There is broad support for farmland protection; farmland heritage, environmental reasons, and protection of future food supply were important reasons.
Variyam et al. (1990)	National	Support for a variety of agricultural programs suggests that preservation of family farms is important, but respondent self-interest also influences support for agricultural policies.
Dillman and Bergstrom (1991)	Greenville County, SC	Positive, though small, benefits to protection of farmland, with the benefits of such protection stated as being limited to changes in rural amenities. The low values are attributed to the large amount of agriculture in the study region.
Kline and Wichelns (1994, 1996)	Rhode Island, Pennsylvania	Environmental reasons are most important, followed by local food concerns, preservation of rural communities, and slowing development.
Bowker and Didychuk (1994)	New Brunswick, Canada	Willingness to pay for farmland protection is correlated with membership in environmental organizations and “visiting the land” and is negatively correlated with distance to farmland.
Ready et al. (1997)	Kentucky	Positive difference between survey-derived compensating variation measures and house-price/wage-rate hedonic measures of the value of protecting horse farms suggests that these farms have an existence value.
Rosenberger and Walsh (1997)	Routt County, CO	Protection of ranchland yields small overall per acre values. These values may be substantially larger if preferences of summer visitors are considered.
McLeod et al. (1999)	Sublette County, WY	Residents prefer continued agriculture on some lands, and wildlife/recreational uses on others, with development never a preference.
Krieger (1999)	Chicago suburbs	The support for rural land protection (which includes farmland protection) seems to be derived from quality of life concerns, especially those related to sprawl reduction. Compared with other rural land protection programs, the most important reasons stated for supporting farm protection were protecting family farms and maintaining food supplies.
Boyle et al. (2001)	Several States	Focus groups suggest that the public favors protection of family farms, protecting land with water on it, and favoring land with active farming.
Duke et al. (2002)	Delaware	Delawareans seem to be most concerned with keeping farming as a way of life, having access to locally grown agricultural commodities, protecting water quality, and preserving rural character.

In several studies on preferences for farmland preservation goals in Rhode Island, Kline and Wichelns found that protecting water and wildlife were most important, followed by local food concerns, maintenance of farming and rural communities, and slowing development. Protection of farmland for purely agricultural reasons was important, but not a prime concern.

Krieger found that protection of farmland around Chicago was important, with farmland preservation being commensurate with more traditional concerns (such as schools and crime reduction) in terms of budget priorities. The support seems to derive from quality-of-life concerns, especially those related to sprawl reduction. Farmland and other types of open space were viewed as roughly equivalent in terms of their ability to maintain quality of life. Protection of family farms and maintaining food supplies (i.e., characteristics uniquely provided by farmland) were recognized as the most important reasons for preserving farmland, while protection of wildlife and recreational needs (amenities not unique to farmland) were seen as better served by other programs.

Recent work by Boyle et al. examined how a variety of farmland attributes influence public support for farmland preservation. Using focus groups in several different States (Ohio, Georgia, Colorado, Oregon, and Maine), individuals were asked to comment on photographs and verbal descriptions of various rural parcels, and were presented with a draft survey that offered choices between different farmland preservation programs. While the results are preliminary, and are based on small convenience samples, several factors seem to stand out in importance. These include preferences for the protection of family farms, protecting land with water on it, and favoring land with active farming (as opposed to abandoned lands, clearcuts, and other signs of overuse or neglect).

Pfeffer and Lapping (1995) found that preservation of important forms of conventional agricultural production like dairy farming is not what non-farm residents wish to conserve. Exactly what type of farm production they would encourage via PDR is unclear, and is probably unclear to the public. Earlier work, using results from a focus group analysis of planners found no consensus among planners in the group about whether the central goal of PDR and TDR programs

was to maintain farming or simply to protect open space (Pfeffer and Lapping, 1994).<sup>16</sup>

These studies suggest that the public has a variety of reasons for protecting farmland, ranging from environmental concerns to protection of family farms to protection of food supplies. No single reason seems to dominate, though some reasons may be most important in select regions (e.g., environmental concerns in Rhode Island). This implies that preserving amenities uniquely associated with farmland may not be a dominant preference nationwide.

Abstracting from the actual findings of these few studies, these types of "stated preference" studies may suffer from a number of potential biases and are difficult to validate. One alternative is to examine people's willingness to pay for open space in the vicinity of their homes, as evidenced by differences in housing prices. A recent study by Irwin and Bockstael uses parcel-level sales data on suburban and exurban houses in Maryland, and tests the effect of various types of open space on housing prices. Their findings suggest that people are willing to pay more to live near lands that are privately held but protected from development—for example, conservation easement lands—than lands that are either developable (but currently unimproved) or lands that are publicly owned open space. While not definitive evidence of people's preferences for particular rural

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<sup>16</sup> Given their interactions with various segments of the local population and their task of developing plans that reflect local interests, planners should provide valid information about local expectations. Pfeffer and Lapping note that:

"The protection of open space is another environmental concern that may oppose *farmland* preservation. For those that value the protection of open space more than agriculture, farming is seen more as a means to an end than as an end in itself."

They quote one of their focus group participants:

"When farms get to the point where they are concerned about farmland protection, it's at a point where farming is really not a viable way of life. There's the last few farms in town, and it's too late. I think we have to make a distinction between farmland protection for the sake of agriculture and open space protection, and that's where a lot of towns start to push to protect farmlands. Where it's scenic qualities and other environmental attributes as opposed to wanting it to be there for agricultural purposes and, in fact, we'll often have situations where towns will move to protect the farm, and then try to prevent it from being used as a farm."

amenities associated with farmland, and while applying only to those living in proximity to farmland, this study suggests that people have differing values for different types of open space.

Another alternative strategy is to consider the intent behind implementation of actual rural land preservation programs. Since these require a commitment of resources (albeit social resources, rather than individual resources), closer investigation of rural land preservation programs may reveal the actual prefer-

ences of the public.<sup>17</sup> Also, the translation of the laws into practice—that is, how preservation agencies design the programs that preserve land—may suggest the relative importance of particular amenities. The next chapter presents our investigation, which takes a close look at State and local programs.

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<sup>17</sup> The examination of why people vote for or against public programs has also been used to highlight the relative importance of public expenditures (Kahn and Matsuka).