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Land-Use Policy – Agriculture and Urbanization

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What are the challenges and issues?

For many Americans, the loss of farm and forest land ranks as one of the most significant land use problems. Since peaking in 1950, agricultural land has decreased at an estimated 1 million acres per year. Increases in the population, desire for larger lots in less urban settings, advances in communication technology, and improved transportation have all increased the demand for agricultural land for low density housing development and the requisite roads, schools, and commercial institutions needed for these new residents. Between 1982 and 1997, U.S. population grew by 17%, while total urbanized land area grew by 47%. The acres per person for new housing have almost doubled in last 20 years. Since 1994, housing lots greater than 10 acres accounted for 55% of total land developed in U.S. (Heimlich and Anderson 2001). How has agriculture responded to this influx of low density development and non-farm neighbors?[1]

These non-farm neighbors have created many challenges for the farm community. However, increased proximity to consumers of farm products and sources of employment has also led to opportunities.

[1]See "Land Use Changes: Economic, Social and Environmental Impacts," JunJie Wu, Transatlantic Land Use Conference Policy Brief No. 1 for other impacts from land use change.

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As non-farm home owners move close to agricultural operations, they find the unexpected and unpleasant odors, dust, farm waste disposal, and the timing of agricultural activities objectionable. Many new residents have bought their dream home in the country without understanding they may be woken up at 6 am, forced to smell manure on hot summer days, or have invasions of flies. Therefore, many farmers have received complaints from these new neighbors about normal agricultural operations (Larson, Findeis, and Smith 2001). As a result of these complaints, farmers may alter their farm practices to those that are less cost-effective. If farmers refuse to adjust their practices, objections can escalate and result in formal nuisance complaints and lawsuits. In addition, as the agricultural landscape becomes fragmented by scattered housing development, the ability to have efficient operations declines.

Proximity to non-farm neighbors can also result in increased problems with vandalism, theft, trespassing, and stressed farm animals. Teenagers may think riding their bicycles and off-road vehicles across an open field affects nothing. Children and household pets may enter pasture land to see and pet the cows, horses, geese or chickens unaware of the dangers involved or the stress caused to the animals. Thus the **spillover effects** from the low density development may reduce overall agricultural net returns. But just as importantly, the operational difficulties cause uncertainty about the long-run profitability of the farm sector as more homes are built. The uncertainty creates an **impermanence syndrome**, in the sense that farmers see no long-run future in farming in the area and decide to invest less in the farm enterprise (Gardner 1994). They may stop adopting the newest technologies that might increase their yields and/or decrease their costs resulting again in lower profits.

In addition, as farmers exit the industry fewer farmers are left to support the input and equipment businesses and veterinarians who care for the animals. Similarly, the product marketing firms and food processing plants may disappear. A rural area might see the loss of its farm support businesses. As the farm owner has to go further to buy inputs or sell outputs, his or her costs increase and profits decline. This loss of a critical mass of farmers may have social and political as well as economic consequences. The overall effect of these two phenomena is a decrease in the profitability of the farm and an increase in the relative attractiveness of selling the farm for housing development. In some sense, the uncertainty that creates the impermanence syndrome becomes a self-fulfilling prophecy.

In addition to the impacts on their agricultural operations, the increased demand for land is pricing urban-rural fringe farmland out of the reach of existing farmers who may need to expand their operations to achieve efficient scale. Because the farm population is aging, escalating land values become even more important. Younger farmers seeking to enter the industry will find starting a farm unaffordable as the main input, farmland, becomes too expensive unless they inherit the land. Urban influences affect about 17 percent of the nation's agricultural land. For these urban-influenced zones, two-thirds of the value of farm parcels derives from the urban proximity ($1,240 of the $1,880 per acre average)

(Barnard, Weibe, and Breneman 2003). As housing values increase in an area, so does the value of farmland. A $1,000 increase in median housing value was found to increase the value of farmland by $27.50 per acre (Hardie, Narayan, and Gardner 2001). This encourages real estate investors to purchase the appreciating land to achieve high investment returns. With the current sub-prime mortgage crisis, real estate investors may be taking a hiatus from this type of investment, but no one is certain this hiatus will be of long duration.

Farming near the City

While problematic in many ways, metropolitan farms can be quite successful if they take advantage of the opportunities proximity provides. If farmers adapt to these prospects, they can be successful; in fact, metropolitan farms can have twice the income of more traditional farming operations. Many metropolitan farms grow high value crops and sell to consumers directly; others benefit from the proximity of off-farm employment opportunities to increase their family income. Thus, although population growth and closeness to metropolitan areas can create an impermanence syndrome and create spillover impacts, farmland loss is not inevitable if the farm sector shifts to new commodities and enterprises more suited to this environment (Lynch and Carpenter 2003). The growing slow and local food movements provide support for farm locations close to population centers. The expanding farmers' markets and community supported agricultural ventures provide a growing number of outlets for direct marketing to consumers. Opportunities could also include pick-your-own produce and agri-tourism where people in the local area come out to the farm. These approaches allow farmers to obtain top dollar for their commodities while providing consumers with a source of locally grown fresh food.

Retaining farmland and preventing low-density development in farm fields

Should farmland retention be a goal of local communities? The U.S. population is increasing, and people have to live somewhere. Moreover, technological advances in agriculture have increased per acre yields, requiring less farmland for food and fiber production. Economists ask "What is the market failure in the conversion of this farmland? Why do we need a policy to prevent conversion?" If conversion occurs because people are willing to pay more for land for residential and commercial structures than a farmer can earn by growing a crop on it, then it would appear that the optimal outcome is conversion (Lynch 2005). Of course, other policy interventions such as transportation policies, educational policies and school quality, banking regulations, and crime prevention or lack thereof all affect development patterns and may contribute to less farmland being retained than society would like. Non-market values or willingness to pay for the **multifunctionality** of farmland derive from the desire to preserve the amenity values of open space and rural character, to slow suburban sprawl, to provide wildlife habitat, to provide local food supply and food security, and to improve water quality.

Given that society continues to express a desire to retain farmland and change the pace and pattern of development[2], what would an optimal preservation strategy be? A farmland retention policy should seek to do three things:

1. enhance the profitability of farming in the region,
2. decrease the obstacles to productive farming such as non-farm neighbors adjacent to productive farms, and
3. slow or end housing development in the farming area itself and redirect it to non-agricultural areas.

It may accomplish these goals by protecting farmland from conversion and/or redirecting new development to desirable non-rural areas. Protecting farmland and redirecting development both have spatial aspects. Planning is thus an important and fundamental first step to choosing the right protection techniques and spatially differentiating where farmland retention is desired and where development is acceptable. Planning efforts can be aided by ecosystem-level spatial and temporal scale analysis including the modeling of ecosystem structure and function. Planners and resource managers should seek to balance population growth, consumer tastes and preferences for housing and open space, and land conservation. Regional planning efforts are also imperative to ensure farmland protection in one area does not spill over and create conversion problems for adjacent areas. For example, limiting or prohibiting development in one rural area through low-density zoning or urban growth boundaries has led to leapfrog development which simply pushes the conversion problem into another rural area.

Farmland preservation policies can be categorized as regulatory, incentive-based, and participatory with a fourth category being a hybrid of two of the other three types (See Box; this section on techniques is drawn heavily from Duke and Lynch 2006). Each category impacts the land market differently and may have challenging implementation issues. Issues of funding, administration and equity may also come into play. Farmland will be retained when the techniques prevent non-agricultural development or affect the price of farmland within the market to reflect the social value it provides to the community. Affecting the market price can involve government participation in the market or altering the relative value of the land in an agricultural use compared to a more developed use.

Regulatory Techniques

Regulatory techniques such as agricultural zoning, right to farm laws, and urban growth boundaries make rural area “off-limits” by changing the rules in the agricultural land market to both protect agricultural and redirect development. They rely on police power of the state to mandate a socially beneficial behavior and thus require very little tax revenue to retain productive agricultural land. They

[2]See “Using Research on Farmland Amenity Values to Improve Preservation Policy,” Joshua M. Duke, Transatlantic Land Use Conference Policy Brief No. 3.

also can be designed to preserve large contiguous blocks of land providing farmers with more freedom from spillover impacts so that they can operate without constraints. Regulatory techniques can target areas where farms are considered most productive and retain a critical mass of farmland. While these types of regulations may aid current farmers operationally and increase profit, they may be difficult to enact due to concerns about their impacts on land value (limiting rights may reduce land values) and thus long-term wealth. In areas with a strong and viable agricultural base, agricultural zoning might generate sufficient support to be enacted especially if agricultural landowners believe they have sufficient political capital to alter the zoning in time (Esseks and Long 2001). However, in areas where the urban influence has increased land value dramatically, limiting the land-use options without compensation could be seen as a regulatory taking and thus may not be politically feasible or may result in lawsuits against the local government.

Another concern with these types of techniques is that they are not permanent. Variances are permitted in many cases. Zoning regulations and urban growth boundary lines can be changed with each new set of elected officials. Individuals including the farm community behave in a manner to alter these regulations to achieve their long-term benefits, especially if they believe the regulations will be changed in the near term.

Local communities also express concern that regulatory tools may drive up the cost of housing by restricting the amount of land available or the number of houses permitted (Glaeser and Ward 2006). Another technique, cluster zoning, only functions if consumers find the housing format acceptable. In addition, cluster zoning still permits housing to be constructed in an agricultural area and thus does not prevent negative spill-over impacts.

Regulatory Techniques
Agricultural Protection Zoning – establishes farming as the only permitted land use and other activities such as housing development are severely limited to children or tenants
Cluster Zoning – requires that new homes be placed near one another, or “clustered.” The remainder of the parcel is preserved as a farm or open space
Right to Farm Laws – protect farmers who are using acceptable, normal farming practices from nuisance complaints from non-farm neighbors
Urban Growth Boundaries – create a “sharp” perimeter around metropolitan areas, beyond which housing and commercial development are prohibited
Growth Management Regulations – slow the rate and alter the location of development by establishing areas where growth is permitted and areas where it is not permitted
State Executive Orders – enable the governor or state agencies to allocate funds or create policies, programs, or agencies to protect farmland quickly

Mandatory Real Estate Disclosure – provides all home purchasers with information about normal agricultural practices including dust, noise, insects, smell, and farm equipment on the road. A signed, informed disclosure document required before closing on a sale.

Incentive Based Techniques

Incentive-based techniques, such as use value assessment for property tax purposes, impact fees and exactions, farm commodity programs, conservation programs, green payments for eco-system services, and recapture tax at the time of conversions, reward the land use decisions that most benefit society and penalize those less preferred. These techniques can be coercive, i.e. increase the cost of undesirable land uses, or rewarding, i.e. subsidize the cost of desired land use. Because compensation is paid or higher agricultural returns ensured within the existing market, the price landowners receive for continued agricultural use increases. Therefore, landowners are relatively more likely to choose a land-use that provides the highest benefits to society.

Many of these techniques are voluntary and thus generate less opposition to enact, but many are more costly in terms of tax revenues or tax revenues not collected than regulatory techniques. Many local governments do not have enough funds to ensure a sufficiently high level of participation to prevent housing development within agricultural areas. If the relative land price in a non-agricultural use increases sufficiently, landowners will convert the farmland from the agricultural use. Therefore, they are more likely to simply slow the conversion of farmland rather than achieve a critical mass of retained productive farms.[3] In addition, governments have rarely targeted these types of techniques spatially, i.e. farmland in all areas of a county receives use-value assessment. Therefore, a government foregoes more tax revenue or these techniques cost more than if they had been targeted to a particular area. Limited targeting also means that some landowners, such as real estate investors and wealthy “hobby” farm owners, can hold agricultural land less expensively. Techniques such as circuit-breaker tax can limit benefits based on some family or farm income threshold. Incentive based techniques also can be altered relatively easily – changes in tax rates, changes in incentive payments, etc., depend on the political will and the resources available.

[3]Use value taxation was first introduced in 1956 and has been evaluated. The evidence on how effective use value assessment has been in slowing the rate of farmland conversion is mixed – some find no impact whereas others find farmland and farm conversion has slowed (Heimlich and Anderson 2001; Lynch and Carpenter 2003; Blewett and Lane 1988; Parks and Quimio 1996).

Incentive Based Techniques
Impact fees, Exactions, and Mitigation Ordinances – are implemented or due when the land is converted from agricultural or forest use to cover the cost of providing additional infrastructure and services.
Mortgage Assistance – provides certain buyers such as beginning farmers with financial assistance or subsidized loans to lower their costs to buy the land. Could vary with the threat of conversion
Recapture or Rollback Penalty – requires the landowner to repay part of the property tax savings he/she accrued due to use-value assessment usually based on the number of years the land or amount of benefit received at the time of converting the land from an agricultural or forest use
Use-Value Assessment – values the land at its agricultural use value rather than the full market value to compute the property tax.
Circuit Breaker Tax – restricts the use-value assessment assessments to lower income farmers rather than higher income farmers or land speculators through an income tax credit rather than property tax rebate.
Transfer Tax – requires the landowner to pay a percentage of the market price of the land as a tax upon conversion of the land from an agricultural or forest use.

Participatory Techniques

The government may also “participate” in the land market by buying or selling parcels of land or lesser rights in land. For example, the government may purchase land, use eminent domain, purchase partial rights such as the right to build houses and restrict the land with an easement, or use a right of first refusal approach to ensure the retention of farmland. Other than eminent domain, participatory techniques are voluntary and often the creation of these programs is relatively simple and faces little opposition.

Participatory techniques allow more spatial targeting and directed efforts by which only parcels contributing to the desired goals are enrolled. PDR programs appear to be achieving their goals and slowing the rate of farmland conversion (Lynch and Musser 2001; Liu and Lynch 2006). However, because the government enters the land market to buy rights, these techniques are more costly from a tax-payer perspective than either the regulatory or the incentive-based techniques. And thus, they often cannot enroll sufficient acres to achieve all of their goals. Because the government acquires rights in the land, these techniques operate as a permanent means of preserving the agricultural land and as such may be very difficult to alter. Eminent domain could be used in targeted areas to enroll hold-out landowners. Public access could be permitted on those parcels owned fee-simple while private rights against trespassing could be protected on those for which the government holds lesser rights. Term easements are a temporary technique and would simply slow the rate of conversion rather than

permanently retain the land. These could be beneficial to prevent conversion of farmland when the government has insufficient funds to buy more permanent rights. Unless sufficient tax revenue is allocated or other financing mechanisms developed, the ability to retain a large number of productive farms with this type of technique will be hampered, especially if land values continue to escalate. As a further complication, several studies have found that adjacency to preserved farmland increases one's land value (Geoghegan, Lynch and Bucholtz 2003, Irwin 2002). Right of first refusal has a high degree of support as an innovative technique for farmland retention – in part because governments are not forced to have money up front but can respond to an actual conversion threat (Duke and Lynch 2007).

Participatory Techniques
Fee-Simple Purchase or Negotiated Sale – a government buys the land outright and obtains all land ownership rights.
Eminent Domain – permits the government to take the land without landowner agreement but with full compensation.
Land Banks – are established such that the government buys land parcels and holds them until there is a purchaser who wants the land for farming.
Purchase of Development Rights (PDR) Programs – have the government purchase partial rights to the property and attach a negative easement prohibiting the right to convert the parcel for residential, commercial, and industrial uses. Also termed Purchase of Agricultural Conservation Easements.
Term Easements – restrict the conversion of the parcel for a limited amount of time such as ten to fifteen years. Programs such as the Conservation Reserve Program restrict agricultural use and purchase conservation activities on a term contract basis.
Rights of First Refusal (ROFR) – permit the government to be at the table if ever a farm owner reaches an agreement with a developer to convert the land. The government could exercise the right and match the negotiated price for development and retain the land in an agricultural use.
Land Leasing – low cost leases for ranch and timber harvest purposes.

Hybrid Techniques

Hybrid techniques often combine the best characteristics of two of the techniques listed above into a single technique. For example, hybrid tools can stress targeting through a regulatory approach and provide some compensation to current landowners to ensure these techniques are politically supported. By combining the strong points of two different techniques, a more effective and supported policy emerges. Transfer of development right programs often use agricultural zoning in a sending area where farmland retention is desired but allow landowners to sell previous rights to develop to be used in another area

where development is desired. Tax benefits derive from receiving a charitable tax deduction for the donation of development rights and provide a means of retaining farmland through a participatory tool at a lower direct cost to the government. By using combinations of techniques, most hybrid tools are permanent preservation although a few, such as TDR, may be altered by changing the sending areas targeted or permitted density in the receiving area. Agricultural districts delay conversion and provide protection from non-farmer complaints similar to agricultural zoning but usually for only a specified number of years like term easements. These techniques for the most part preserve productive farms to retain a critical mass.

A concern with these hybrid techniques is that within a single tool one has combined two tools which may have inconsistent assumptions about who "owns" certain property rights. A regulatory aspect implies the government owns the right to set use on the land while a participatory aspect implies the government must compensate the landowners for changing the rights to use the land. This lack of congruity may cause political and legal problems for local governments.

Hybrid
Eminent Domain/ROFR – uses participatory techniques to attach a right of first refusal provision on critical farmlands without compensation such that the government will be at the table if conversion is ever imminent at which a fee simple sale may occur.
Pension Plan/PDR – government could provide retirement benefits to farmland owners in exchange for a conservation easement restricting development
Transfer of Development Rights/Zoning – use a regulatory technique, zoning, to establish a sending area which can sell its right to develop up to the allowable density and a receiving area which can receive this increased density.
Agricultural Districts – mimics agricultural protection zoning by making agricultural the only permitted use but do so in a voluntary and incentive-based way. Landowners (and their neighbors) decide to participate and restrict their conversion options.
Capital Gains Reduction/State Income Tax Reduction/Bargain Sales/PDR – provide relief from capital gains taxes, state income tax, or provide charitable deductions for farmer-to-farmer sales and/or development right sales.
Installment payments with PDR – uses participatory techniques which spreads out payments for tax purposes as well as to leverage government funds
Point Systems with PDR – uses a participatory technique but bases compensation on the attributes of the land most valued by society rather than by the land market.

Along with well-developed plans and the outlined policies above, communities can support farmers' adaptive behaviors on the rural-urban fringe. Farmers have adapted to the changing environment in quite diverse ways, whether by

changing one's commodity mix, or by taking advantage of the uniquely urban opportunities to market directly to the consumer. Recent evidence suggests that the farm community has been resilient to large losses of farmland over time and in some cases per acre returns have actually increased (Lynch and Carpenter 2003). Efforts to encourage these adjustments may facilitate farmers' transition and success. Policies such as requiring mandatory real estate disclosure of normal agricultural practices for potential rural residents, and implementing right to farm laws, may aid in these endeavors.

Implications for Agriculture, Urbanization and Policy

Few individuals support the pace and pattern of housing and commercial development and the loss of farm and forest land that the U.S. has experienced in the last 50 years. The widespread impact on water quality, air quality, loss of open space, wetlands, and wildlife habitat from many areas of the country and the stagnation of inner cities and suburbs suggests a new approach to land use is needed. A do-nothing approach will probably result in on-going fragmentation in rural areas and unsightly sprawl. Regulatory, incentive-based and participatory policies along with regional and local planning can all play a role in achieving a more socially beneficial land use pattern given the anticipated population growth and tastes and preferences of housing buyers. Counties and state government may also need to consider the practical implications of using multiple farmland retention policies, i.e. mixed messages need to be avoided. Judicious use of these policies can enhance the profitability of farming in the region, decrease the obstacles to productive farming such as non-farm neighbors, and slow or end housing development in the farming area, thereby allowing the agricultural sector to survive.

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