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Abstract

Agricultural conservation easement programs have recently generated much interest and concern regarding their effectiveness in preserving active farmland. This paper reports findings which help clarify the debate about the likelihood of achieving stated public goals, with emphasis on challenges facing farmers in urbanizing areas. Previously unstudied characteristics of participants in Pennsylvania's program were elicited and analyzed. The results suggest that farms deemed more at risk of conversion to non-farm uses were represented more heavily in the program than in the aggregate Pennsylvania farming community. However, no linkage was found between conservation easement sales and adaptation toward more successful commercial farming.

Key words: Conservation easement, farmland preservation

The wisdom of preserving agricultural land is subject to ongoing public policy debate. Regardless, farmland preservation receives broad public support and several types of policies have been enacted to protect farmland from competition in the marketplace. An increasingly common farmland preservation technique is the purchase of agricultural conservation easements. This paper treats the social desirability of farmland preservation as given through the political process, and restricts attention to the effectiveness of agricultural conservation easement programs in attaining their stated objectives.

The experience of Pennsylvania's agricultural conservation easement program is used to help clarify two issues of debate among land use planners, farmers, and policy analysts. The first issue concerns the extent to which conservation easement programs preserve farmland which would otherwise convert to non-farm uses. Hence, the focus is not on the volume of easement sales but rather on the differential effect of the program. The second issue addresses the fact that conservation easement programs may protect farmland, but do not explicitly protect farmers from the many other challenges facing commercial agriculture in urbanizing areas. Empirical evidence that farms preserved under conservation easements also engage in adaptation to urbanizing environments would be a positive indicator that conservation easement programs can attain farmland preservation goals.

Farmland Preservation and Agricultural Conservation Easements

Development rights on real property can be transferred to others while retaining the remaining rights of ownership, and consequently maintain a value separable from the value of other ownership rights. For example, the development rights on farmland can be valued

as the difference between the market value of the property and its agricultural value. In a conservation easement program farmers voluntarily enter into a contract to sell the development rights of the farm in exchange for a cash payment. The proceeds are taxable as a capital transaction, and the basis of the real property is reduced by the sale amount. The development rights are purchased by an authorized government agency, or sometimes by a nonprofit organization, and held in perpetuity. The farm may be sold at any time or passed on to heirs with all property rights except the development rights left intact.

The goal of agricultural conservation easement programs is to preserve a critical mass of farmland and ensure survival of farm support businesses (Daniels). Questions have been raised about the high cost of conservation easement programs (Lapping, Daniels, and Keller; Derr). Some analysts argue that the market should determine land use, possibly removing farmland from production and replacing it with nonfarm development. Geisler questions the efficacy of purchasing conservation easements, suggesting that the domestic importance of land-based occupations is fading as service sector employment expands while manufacturing and extractive industries decline.

Conservation easement programs are voluntary and do not guarantee that viable farms in high cost areas can be retained at reasonable cost. As the easement holder cannot require that a parcel be farmed, the danger arises that the programs will devolve into open space acquisition rather than farmland preservation programs (King). Another concern is that conservation easement programs are merely a bail out for marginally successful farmers or those who intend to exit the industry anyway (Lembeck, Kelsey, and Becker). Finally, municipal governments may sacrifice tax revenues by keeping land in farming.

On the other hand, farmland preservation receives strong public support and conservation easements have the advantage of permanence over other techniques. Conservation easements offer farmers a middle ground between zoning, which does not pay compensation, and selling out to developers (Daniels). Equity is another advantage of conservation easements, allowing farmers to be compensated for the "commodity" value of the property while retaining the "resource" value. Farmers also receive property and estate tax benefits (Mittleman, Katz, and Vilms).

Several researchers have conducted investigations of conservation easement programs in the Northeast. One study reviewed the relationship of cost to the characteristics of preserved parcels in Rhode Island (Wichelns); another examined economic efficiency in the selection of parcels (Morris). Lessley discussed the integration of conservation easement programs with other farmland preservation programs. King reviewed the political issues raised by conservation easement programs.

The relationship between conservation easement programs and agriculture in urbanizing areas is of interest to land use planners and policy analysts, but has received comparatively little attention in prior studies. Commercial agriculture best survives in metropolitan areas by engaging in a wider range of farm enterprises, tailoring production to local food demands, producing higher value per acre products, and providing more services than non-metropolitan farms (Gardner; Heimlich and Barnard). Heimlich and Barnard denote this form of agriculture as "adaptive" as opposed to "traditional" farming, such as dairying. Urbanization and land speculation has been empirically determined to exert strong downward pressure on agricultural land use and capital investment (Lopez, Adelaja, and Andrews).

However, capital investment on adaptive farms was found to be almost twice as high as capital investment on traditional farms (Heimlich and Barnard).

Residents of urbanizing areas tend to support farmland retention and growth control programs which retain open space and visual amenities, yet oppose agricultural disamenities such as manure odors and chemical spraying. The impact of conservation easements on participating farms is especially important to understand because it affects whether the easements truly maintain farming, or simply end up preserving open space. Easements may reduce growth and tax pressures on the farms, but by themselves they do little to protect the farms from other conflicts with urbanization. Unless these farms also adapt their production to their urbanizing environment, simply prohibiting development on farmland will not guarantee survival of a viable metropolitan agricultural sector.

Pennsylvania's Conservation Easement Program

Pennsylvania is the leading agricultural state in the Northeast. There are over 50,000 farms, over one fourth of the state's land is devoted to agriculture, and 1993 cash receipts from Pennsylvania crop and livestock production totalled over $3.7 billion (U.S. Department of Agriculture). Dairying dominates Pennsylvania's agricultural sector, accounting for over 40 percent of cash receipts from farm marketings. Feed for dairy cows and livestock is the second major output of the state's farms. Poultry, egg, and mushroom production are also significant.

In Pennsylvania the greatest population pressures on rural and farming communities are occurring in the same areas where the most productive agricultural land exists. Eight of

Pennsylvania's top 10 agricultural producing counties are located in the southeastern part of the state, an area under population and development pressure from the nearby Philadelphia area, New Jersey, Baltimore, and Washington, D.C.

This conflict for space has attracted the attention of farmers, lawmakers, municipal officials, growth boosters, home buyers, and environmentalists. Due to agriculture's economic significance and other positive contributions in Pennsylvania, the agricultural preservation movement has sustained strong support from the citizenry. In a 1990 survey of over 3,600 Pennsylvanians, 70 percent said that preservation of farmland should receive greater attention (Lembeck, Willits, and Crider).

Pennsylvania has enacted a wide variety of farmland preservation programs, including preferential tax assessment, agricultural zoning, creation of agricultural security areas, right-to-farm laws, benefit assessment exemptions, review of eminent domain actions, and most recently, agricultural conservation easements. Until recent years the predominant preservation techniques used in Pennsylvania were agricultural zoning and preferential tax assessment. Zoning is essentially costless to the general public and is referred to as a first generation policy tool; preferential taxation is a low-to-moderate cost technique and is termed a second generation policy tool, and conservation easements are costly and referred to as a third generation technique.

Serious discussion concerning how to design and finance a conservation easement program in Pennsylvania began in 1986; a rudimentary program outline and a decision to fund the effort with a bond issue was made in 1987. In the following November general election nearly 70 percent of voters answered "yes" to a referendum question asking if they

favored incurring a $100 million debt to purchase conservation easements from farmers. The program was enacted as an amendment to the Agricultural Security Areas Law and oversight was assigned to the State Agricultural Land Preservation Board. The statute authorizing the program, administrative guidelines, and all subsequent policy made it abundantly clear that the purpose of the program was to preserve viable farmland. It was not conceived to be, nor is it to become, an open space acquisition program.

Under Pennsylvania's program, eligibility to sell a conservation easement is contingent upon meeting five basic requirements: (1) the farmland tract must be located in an agricultural security area established under State law by a local government unit, (2) the applicant farm operation must generate or be capable of generating at least $25,000 in annual gross receipts, (3) 50 percent of the land must be in Soil Conservation Service classes I through IV, (4) 50 percent of the land must be harvested cropland, pasture, or grazing land, and (5) the yield per acre of agricultural commodity (e.g., corn, oats, wheat, barley) must meet the county average for harvested cropland. In addition to these basic requirements county agricultural land preservation boards may add further criteria.

A farmer who is interested in selling conservation easements applies to the county board. As of December 1992, 35 counties had created boards and 32 counties had been certified to participate in the program. If the farm meets the five basic eligibility criteria it is then scored against land evaluation and site assessment criteria set up by the county and a numerical score is assigned to the tract. The highest scoring farms are then appraised to determine the agricultural value of the easement and the process of negotiating the final sale price and other details is carried out.

Pennsylvania's agricultural conservation easement program sold its first 205 conservation easements during the period from December 1989 to December 1992. A total of 24,347 acres were purchased for $50,882,900, an average of $2,090 per acre. Sales were heavily concentrated in the southeastern part of the state. Lancaster County alone accounted for 36 percent of the sales. Seven other southeastern counties each contributed between five and nine percent of the sales, with 13 additional counties each accounting for less than five percent of the sales.

Data Collection

The first 205 Pennsylvania farmers selling agricultural conservation easements were surveyed to learn about their motivations for participating and the impact of the program on their farms and their lives. The sample included all farmers who sold easements between December 1989 and December 1992. The survey instrument asked sellers to describe their farm and major farm products, their motivation for selling the easement, how the proceeds of the sale were used, and general information about the farmer and spouse. The survey used a modified Dillman approach with an initial mailing, a reminder postcard, and a second letter and survey for non-respondents. A total of 161 questionnaires were received, representing an overall response rate of 78.5 percent. The response rate varied substantially across counties; for example, the Lancaster County response rate was approximately 50 percent. In the remainder of the paper, those who sold conservation easements will be referred to as participants or respondents. Pennsylvania farmers in counties where the program was active at the time of the survey who did not sell easements will be referred to as nonparticipants.

Survey Results

Frequency tables were used to clarify the distribution of respondents across counties, age groups, and farm types. Reasons for selling an easement and uses of easement proceeds were similarly tabulated. Broad classifications of key variables were developed to ensure adequate subsample sizes while retaining meaningful characteristics.

Two broad age groups divided at age 55 were analyzed, based on prior expectations that farmers approaching retirement might participate in the program for different reasons and use the proceeds in different ways than younger farmers. Where appropriate, participants over age 65 were considered as well. The disproportionately high percentage of sales in Lancaster County prompted an analysis of differences between participants in Lancaster County and those in the other counties. Lancaster County is Pennsylvania's most productive agricultural county, is subject to strong development pressures, and is heavily represented by the Amish farming community. Farm types were delineated between dairy and non-dairy because dairying is the dominant agricultural activity in Pennsylvania.

Age of Participants

Participants were significantly older on average than the aggregate Pennsylvania farming community, but age distributions were relatively uniform across subsamples of participants, as shown in Table 1. Age data regarding the aggregate group (participants and nonparticipants) was drawn from the 1992 Pennsylvania Census of Agriculture (U.S. Department of Commerce). The difference between the age distributions of Lancaster County participants and all Lancaster County farmers is notable.

Implications of this skewed age distribution for achievement of the program's objectives are ambiguous. The closer a farmer is to retirement, the lower would be their expected net present value of making a large change in the farm's operation. Hence, the high proportion of older farmers enlisted in the program lowers expectations of significant farm expansion or adaptation early in the program's history. Depending on how essential adaptation to one's urbanizing environment is for commercial success, one might argue that the farms being preserved are not those best equipped to survive in an urbanizing environment, and may soon lapse into inactivity. In contrast, farmers nearing retirement may be among the most likely to sell their farm in the near future, in which case the program appears to preserve those farms most at risk of conversion to non-farm uses. The intention of keeping the family farm in operation was frequently expressed by respondents, thus tempering concern that the program will immediately devolve into open space acquisition, and suggesting that many farmers felt that selling the farm for development might have been necessary in the absence of the conservation easement program.

< TABLE 1 HERE >

Reasons for Participation

In the survey, farmers were asked why they participated in the program. Three broad reasons emerged from the various responses. The "agricultural preservation" reason encompassed statements about saving farmland, maintaining farming as a way of life, keeping the farm in the family, and stopping development. The "finances" reason contained money concerns like paying off debt, taxes, estate planning, and investment. Retirement was

listed by seven respondents and constituted a third general reason. As respondents often listed multiple reasons, three additional categories representing possible combinations of the basic categories were formed.

The majority of participants reported that they sold conservation easements based on personal convictions supporting farmland preservation and maintenance of the family farm, as shown in Table 2. Relatively few participants listed only financial reasons for selling. Over half of the respondents fell into the "agricultural preservation only" category. An additional 26 percent gave both agricultural preservation and financial reasons, while 11 percent of respondents gave only financial reasons. Given the large percentage of older participants, retirement was rarely offered as a reason for selling an easement. Older participants were more likely to give only preservation related reasons for selling easements, while farmers in the younger age group were almost twice as likely to give only financial reasons for participating (see Table 3).

Of the subgroups defined within the sample, only Lancaster County participants deviated substantially from the aggregate distribution of reasons for selling. Twenty-two percent gave only financial reasons for participating. This response is curious because Lancaster farms are under some of the most intense development pressure. Given the lower survey response rate of Lancaster County participants relative to other participants, one possibility is that those who responded to the survey from Lancaster County differed systematically from those who did not respond.

The possibility of a bias toward reporting socially desirable reasons on the survey is an important concern. Several factors reduce (but do not eliminate) the potential for such

bias. An open-ended question was used to elicit reasons, respondents' entries in the comment section at the end of the survey were generally consistent with their answers, and respondents were assured of anonymity. Furthermore, those with purely financial interests would presumably have greater incentives to sell to developers, and would tend not to participate in the program. Participants are expected to be sensitive to financial considerations regardless of personal convictions; the interesting result is that personal convictions were expressed so strongly relative to financial reasons.

< TABLE 2 HERE >

< TABLE 3 HERE >

Level of Farming Activity

Participants were asked in the survey whether their level of farming activity remained as high after the easement sale. Twenty-two percent of respondents reported that they were not as actively involved in farming as they had been before the sale. Of these, 74 percent were over age 65, and 88 percent were over age 55. Furthermore, 44 percent of these farmers reported that farm income comprised less than one fifth of their total income before the sale, in contrast to only 21 percent for those who remained as actively involved in farming.

If it is reasonable to presume that farmers with declining involvement in agriculture, farmers nearing retirement, and owners who derive less than one fifth of total income from the farm are most likely to sell their farms in the near future, then it appears reasonable to classify these farms as being at higher risk of conversion to non-farm uses. The preservation

of these at-risk farms appears to be a positive indicator of the program's effectiveness in achieving its stated goals. However, the future likelihood that the farms will be commercially successful in urbanizing areas is still uncertain.

Use of Sale Proceeds

Only a small portion of funds received from selling conservation easements was directly devoted to expanding farm operations, as shown in Table 4. Direct farm expansion was indicated by the purchase of farmland, construction of buildings, and purchase of livestock. Other uses included improving cash flow, future financial planning, debt reduction, and off-farm business uses. In the aggregate, 15 percent of proceeds were used to directly expand farm operations, 36 percent were devoted to debt reduction, and savings accounted for 29 percent. As anticipated, younger farmers devoted a significantly higher percentage of easement sale proceeds to farm expansion than older farmers.

< TABLE 4 HERE >

Changes in Farm Production

Table 5 indicates that a relatively small number of farmers (15) changed their primary farm product after the sale, and their characteristics were not representative of the entire sample. Of these 15 farmers, 12 were over 65 years old, 12 reported lower involvement in agriculture after the sale, 11 were dairy farmers before the sale, and none were dairy farmers after the sale. Eight of the 11 dairy farmers converted to either grains or field crops after the sale.

The results suggest that conservation easement sales were not used to fund the transformation of existing farms from traditional farm types to adaptive farm types in urbanizing areas. The few farmers who changed their principal farm product were mainly older dairy farmers who probably grew grains and field crops as part of their dairy operation. A conservation easement sale allowed them to exit from dairying while allowing continued farming using available equipment and experience.

< TABLE 5 HERE >

Summary and Conclusions

Agricultural conservation easements are one of several policy tools for preserving farmland. The use of agricultural conservation easements is a more recent development than other farmland preservation techniques, relatively expensive, and debated by policy makers regarding its effectiveness. This paper draws on a survey of 205 participants in Pennsylvania's conservation easement program to provide useful information about who sold conservation easements, their motivations for doing so, what they spent the proceeds on, and the extent to which the conservation easement program stimulated adaptation to farming in urbanizing areas.

Farmers who participated in Pennsylvania's conservation easement program were older on average than the Pennsylvania farming community. While financial rewards were often stated as an important factor in the decision to sell conservation easements, personal convictions about farmland preservation appeared to be the dominant motivation for the

majority of respondents. Many said they sold the conservation easements to allow younger generations to continue operating the family farm. The great majority of proceeds from conservation easement sales were devoted to improving cash-flow and future financial planning rather than expansion of farm operations. However, over three quarters of participants remained as actively engaged in farming after the sale as they were before. The results suggested that the conservation easement program is being used mainly to support continuation of farm operations rather than promoting either expansion or exit from agriculture in urbanizing areas.

In judging the program's effectiveness, two important criteria appear to conflict: preservation of farmland vulnerable to development pressures, and preservation of farms which contribute the most to a healthy agricultural sector. The likelihood of a farm's imminent sale was speculated to increase as retirement approached, share of off-farm income increased, and gross farm income decreased. By these standards, the results of this study suggest that Pennsylvania's conservation easement program has most likely been successful in preserving viable farmland which might otherwise have been converted to non-farm uses.

However, the relative contribution of these farms toward the maintenance of a commercially successful agricultural sector might be lower than that of full-time, higher income farms operated by farmers in the early or middle stages of their careers. Younger farmers were less likely to participate, but evidence suggested that those who did were more likely to devote easement sale proceeds toward farm expansion. In this regard, buying conservation easements from younger farmers, full-time farmers, and higher income farms may have a greater farmland preservation impact than buying farms more at risk of

conversion to non-farm uses. How much farmland must be preserved for the program to be judged an overall success, and at what cost, can only be decided in the political arena.

No evidence was found that Pennsylvania's conservation easement program stimulated conversion from "traditional" to "adaptive" farm types, which have been shown to be commercially successful in urbanizing areas (Heimlich and Barnard). Few changes in principal farm product occurred, and those which did occur were mainly by older farmers changing from dairy to crop farming. The program itself contains no incentives to pursue adaptation, except that it provides an injection of capital with which to implement a major change in the farm's operation. If, as several studies indicate, farms in urbanizing areas must adapt to their environment to survive in the long-run, this suggests that the program's exclusive focus on land preservation may overlook a need for other incentives encouraging more rapid adaptation to change.

Evidence from this study further suggests that preservation of farmland alone does not immediately promote adaptation toward farm types which are aesthetically better-suited to urbanizing areas. This implies that agricultural disamenities are preserved to the same extent as highly valued farm characteristics. While conservation easements help meet public goals for farmland retention, they initially contribute little to resolution of increasingly prevalent conflicts between farmers and their non-farming neighbors. If adaptation is indeed necessary to ensure survival of agricultural operations in urbanizing areas, it appears that the impetus for such adaptation will mainly come from the personal interests of farmers themselves. Participating farms currently operated by older farmers will eventually pass on to other farmers; a useful extension would be an analysis of farm adaptation after the conservation

easement program has existed for several more years.

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Table 1. Percent of Pennsylvania farmers aged 55 and over: participants vs. non-participants

	Participants	non-Participants
Entire sample ***	58%	41%
Location subsamples:		
Lancaster County ***	61%	27%
non-Lancaster County **	57%	45%

** and *** denote a statistically significant difference between participants and non-participants at 0.05 and 0.01 significance levels

Table 2. Reasons given by participants for selling conservation easements, in the aggregate and by age group

Reasons Given	All Participants (N=156)	Age < 55 (N=60)	Age ≥ 55 (N=96)
Ag. Preservation Only	57%	48% *	63%
Finances Only	11%	15%	8%
Retirement Only	1%	0%	1%
Ag. Preservation & Finances	26%	37% **	20%
Retire & Ag. Preservation	4%	0% **	6%
Retire & Finances	1%	0%	2%

* and ** denote a statistically significant difference between the subsample and its complement at 0.10 and 0.05 significance levels

Table 3. Reasons given by participants for selling conservation easements, by location and primary farm type

Reasons Given	Lancaster County (N=36)	Other Counties (N=120)	Dairy Farmers (N=74)	non-Dairy Farmers (N=82)
Ag. Preservation Only	53%	58%	57%	57%
Finances Only	22% **	8%	15%	7%
Retirement Only	0%	1%	0%	2%
Ag. Preservation & Finances	22%	27%	24%	28%
Retire & Ag. Preservation	0%	5%	1%	6%
Retire & Finances	3%	1%	3%	0%

* and ** denote a statistically significant difference between the subsample and its complement at 0.10 and 0.05 significance levels

Table 4. Average portions of easement sale proceeds devoted to farm expansion

	Percentage of Proceeds Devoted to Farm Expansion
Entire Sample	15%
Location Subsamples:	
Lancaster County	14%
non-Lancaster County	15%
Production Subsamples: ***	
Dairy Farms	13%
non-Dairy Farms	16%
Age Subsamples: ***	
< 55 Years Old	21%
≥ 55 Years Old	10%

*** denotes a statistically significant difference between a subsample and its complement at a 0.01 significance level

Table 5. Changes in Production Before and After Easement Sales, Classified by Primary Farm Product

Number of Farms by Primary Farm Product Before Sale	**Number of Farms by Primary Farm Product After Sale**				
	Dairy	Grains	Livestock	Field Crops	Other
Dairy 73	63 (87%)*	5 (7%)	1 (1%)	3 (4%)	1 (1%)
Grains 35	-	34 (97%)	-	1 (3%)	-
Livestock 21	-	-	19 (90%)	-	2 (10%)
Field Crops 2	-	-	-	2 (100%)	-
Other 20	-	-	-	-	20 (100%)

* Values in parentheses denote row percentages