



Case Study Report

Burlington County, New Jersey

One of 15 Case Studies for the Research Project

Farm Viability in Urbanizing Areas

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Section I: Summary

Market Value of Agricultural Products: At the end of 2006 agriculture still looked viable in Burlington County. Between the 1987 and 2002 censuses of agriculture, the total market value of agricultural production in the county had grown by more than 50% to \$83.3 million. The number of farms had increased somewhat, although most of the growth occurred in the smallest size ranges (one to nine acres and 10 to 49 acres) and the lowest gross sales group (less than \$2,500). While sales of some previously important products like grains and dairy decreased or reached a plateau, revenues grew substantially in other sectors (vegetables, sod, nursery stock, cut flowers, and horses) that were advantaged by the nearby large urban and suburban populations.

Farmer Satisfaction with Markets: In the winter of 2006 we surveyed by mail 140 owners of agricultural land in Burlington.¹ Ninety-five of our respondents were farm operators rather than nonoperator-owners. Relatively few of these Burlington farmers were satisfied with the marketing outlets for the products raised on their land. Exceptions included producers of (a) nursery crops, sod, and flowers and (b) respondents reporting adequate supplies of nonfamily labor. These two groups tended to be pleased with their markets' competitiveness and profitability.

Production Inputs: In 2005 and 2006 we interviewed by phone or in person a total of 31 persons who were knowledgeable about Burlington County's agricultural sector or particular aspects of it: farmer leaders, operators raising specialty crops, agri-service businessmen, and administrators of public and private programs designed to assist farmers. Several of the interviewees with broad knowledge were convinced that the quantity of *land for farming* would remain sufficient for the foreseeable future. They were impressed by the ongoing programs for purchase of development rights; by August 2006 these programs had already preserved more than 24,000 acres countywide. Voters in November 2006 approved a 30-year extension of the special property tax that helps to fund the county program. Agreements for transfer of development rights in two townships and zoning restrictions in the ecologically sensitive Pinelands Reserve Area have protected many acres, also.

For operators looking to expand their farmed land, rental parcels were still fairly affordable in our study period of 2005–2006. However, farmland for sale looked too expensive unless it was

¹ The surveyed landowners were randomly selected from a public list of owners of parcels in Burlington County that under New Jersey law qualified for property-tax assessment based on their agricultural use rather than on their full market value. In urbanizing counties like Burlington, the value of open-space land on the real estate market is likely to incorporate the parcel's potential for residential or other developed uses. We removed from the list all the owners who lived outside of Burlington because we were seeking to survey persons likely to know about agricultural operations on their land in the county. Also removed were ten members of the 300-owner sample who, in responding to the mailed survey, indicated that their land was not farmed in 2005. Also, six questionnaires came back undeliverable. The remaining owners totaled 284. Of that number 140 participated in the survey. No one wrote back that he/she refused to take part. Therefore, we received no communication or undeliverable mail back from 144 cases, and we assumed that proportionally as many of them did not have any land farmed in 2005 as among those from whom we did hear (6.7%). Accordingly, we deducted 10 cases from the 144 and added the resulting number (134) to the 140 participants, leaving us with 274 cases where the land was farmed or likely to have been in agricultural use during 2005. The response rate is therefore 140 completions divided by the 274 likely eligible cases, or 51.1%.

deed-restricted land or in the Pinelands Reserve (or both). The county government's February 2006 auction of seven parcels of preserved land indicated farmers' rather strong demand for purchasing such land. It had been feared that nonfarmers seeking land for estates would have prevailed in the auction.

Neither the surveyed farmland owners nor the interviewed local experts indicated significant problems with the supply of *credit, farm chemicals, seeds, implements, or other manufactured inputs*. Although the last implement dealer in the county had closed, supplies were regularly delivered to farms by truck. In many or most cases, on-farm or near-farm repairs services were provided by local self-employed mechanics.

Farm Labor: Both the survey and interviews showed the labor supply to be problematic. Local citizens tended to reject the working conditions (e.g., stoop labor, high summer temperatures) or the pay that local farmers were offering. Migrant workers were found at many farms. To be employed they needed to submit documents (Social Security cards, US passports, state-issued identification cards) that at least looked valid. However, as of the summer of 2006 the federal government was not holding farmers responsible for going beyond the appearance of such documents, and immigration enforcement officials were not making on-farm inspections. Ironically, the types of enterprises that seemed to be advantaged by the proximity of so many urban and suburban customers—producers of vegetables, fruits, nursery products, cut flowers—appeared to rely greatly on migrant labor.

Water: The adequacy of water supplies for irrigation and livestock seemed to be a looming problem, despite Burlington County's location where comparatively plentiful rainfall was the norm. Agriculture faced competition from non-farm users, and regulation of groundwater usage had already begun.

Also of concern was the *supply of future farmers*. The high cost of land made entry by young people very difficult. Few (17%) of the surveyed owners had developed succession plans for the transfer or ownership and management of their farmland to a relative or other person. Such plans might enable the setting aside of enough financial resources so that heirs not willing or able to carry on the farming could be paid off without the necessity of selling land or other assets of the operations. Local experts pointed to examples of diversified farms (by crop and function, including marketing and processing) that yielded sufficient revenue to provide good employment to members of the next generation.

Nonfarmer Neighbors Constraining Farm Operators: Over a quarter of the sample reported some change for the worse in the farming of their land "because nonfarmers lived nearby." The subgroup of farmers with at least \$50,000 in gross sales registered a significantly higher incidence—40% with such negative changes.

Impermanence Syndrome: Survey questions aimed to learn if an "impermanence syndrome" had set in, that is, whether farm operators were so pessimistic about the future that they ceased to invest in their land's agricultural capabilities. We found, however, that almost two-thirds of the surveyed operators were planning some improvement over the following five years on their

owned land in Burlington County (e.g., erecting or enlarging farm buildings, constructing or extending fences, installing or repairing conservation or irrigation facilities).

Predictions of Agriculture's Viability 20 Years into the Future: The 140 surveyed farmland owners tended to be pessimistic. Only 39% believed that agriculture in Burlington County had a “bright” or at least “modest” future. The respondent’s size of operation did not make a significant difference in these answers. However, respondents were more likely to be relatively optimistic if—at the time of the survey—they found the markets for their farm products to be competitive. They were less likely if some aspect of their operation had already changed for the worse because nonfarmers lived nearby.

Interviewed farmer leaders and agri-service businessmen were optimistic about the futures of certain types of farm enterprises: farms specializing in vegetables and other food products directly marketed to the nearby urban/suburban populations, berries grown in the Pinelands Reserve Area, sod and other landscaping products, cut flowers, hay for livestock and construction sites, and the breeding, training, and boarding of horses.

Policy Recommendations: The final section of this report on Burlington County discusses nine policy recommendations derived from the survey and interview findings. Both the farmers responding to the survey and the agricultural leaders with whom we spoke tended to support some combination of (a) farmland preservation measures and (b) policies to promote the profitability of agriculture in Burlington.

Section II: Burlington’s Geographic, Historical, Agricultural, and Policy-Making Contexts

Section’s Purpose

This section’s main purpose is to provide sufficient information about the county’s geographic, historic, agricultural, and policy contexts for the readers to judge if the Burlington County case study is relevant to their needs. If they find enough similarities between Burlington and their own counties (or other communities of interest to them), they may decide to read further in the hope of learning from Burlington County’s experiences. Many of the described contextual conditions contribute to how Burlington County’s agricultural sector has responded to urbanization.

Location, Size, and Urban Influence

Burlington is the largest of New Jersey’s 21 counties, comprising 514,927 acres (805 square miles) in the southern half of the state, extending southeast from New Jersey’s western border. A study on urban influence conducted by the USDA Economic Research Service (ERS), which we used to select our 15 counties, classified Burlington in 1990 as a county having 51.8% of its land surface subject to “high urban influence.” The remaining 48.2% was under either “medium-low” or “medium” urban influence (Table 1).²

Table 1. Population Data—Burlington County			
US Census data*	2006*	2000*	1990*
Population	450,627	423,394	395,066
Percentage increase, 2000–2006	6.4		
Percentage increase, 1990–2000		7.2%	
Median household income	\$68,090**		
Median value of owner-occupied single-family home	\$259,300**		
Percentage of homes owner-occupied	74.3		
County seat	Mount Holly		
Metro area	Philadelphia-Camden-Vineland, PA-NJ-DE-MD		
Extent of urban influence in county: 1990 measure	51.8% of county was subject to “high” urban influence while the remainder was under “medium-low” or “medium” urban influence†		
Extent of urban influence in county: 2003 measure	Large—in a metro area with at least 1 million residents or more‡		
Land-grant university	Not in county		

Sources:

*US Census Bureau, *State and County Quick Facts*:

http://factfinder.census.gov/home/saff/main.html?_lang=en

**US Census Bureau, *American FactFinder*. http://factfinder.census.gov/home/saff/main.html?_lang=en

² Using Natural Resources Inventory data, the ERS study developed an index of “urban influence” that measured, for each 1990 census block, its accessibility to the populations in other blocks within a 50-mile radius. The more people in those blocks and the closer the blocks with numerous residents, the higher the measure of urban influence for the block being classified. A census block is a “subdivision of a [census tract](#) (or, prior to 2000, a block numbering area); a block is the smallest geographic unit for which the Census Bureau tabulates 100-percent data. Many blocks correspond to individual city blocks bounded by streets, but blocks—especially in rural areas—may include many square miles and may have some boundaries that are not streets. The Census Bureau established blocks covering the entire nation for the first time in 1990. Previous censuses back to 1940 had blocks established only for part of the nation. Over 8 million blocks are identified for Census 2000” (“Glossary,” US Census Bureau American FactFinder. http://factfinder.census.gov/home/saff/main.html?_lang=en)

†See footnote 1, this report.

‡USDA Economic Research Service, *Data Sets: Urban Influence Codes*, <http://www.ers.usda.gov/Data/UrbanInfluenceCodes/>.

The federal Office of Management and Budget has designated Burlington County as part of the Philadelphia-Camden-Wilmington Metropolitan Statistical Area.³ Among metro areas in the United States, this one is classified as “large . . . with at least 1 million residents or more” (Table 1).

Rate and Location of Population Growth

Another selection criterion for our case studies was population growth. While some Northeastern counties lost residents between 1990 and 2000,⁴ Burlington’s population grew by 7.2% between 1990 and 2000 and then by another 6.4% from April 2000 to July 2006, to an estimated 450,627 people (Table 1).

Population growth from 1990 to 2000 was concentrated mostly in the county’s northwestern sections (near Philadelphia, Trenton, and the New Jersey Turnpike) and in townships rather than “boroughs” (i.e., cities or villages).⁵ In fact, all nine of the boroughs lost population between 1990 and 2000, while 23 of the 31 townships gained residents. Of the eight townships with population losses during that decade, five are located in New Jersey’s Pinelands Reserve Area.⁶ This reserve covers the southeastern two-thirds of Burlington County and parts of six other counties and totals about 1.1 million acres.⁷

A 1978 act of Congress created the reserve, where “orderly development” is managed by the public Pinelands Commission “to preserve and protect the significant and unique natural, ecological, agricultural, archeological, historical, scenic, cultural and recreational resources of the Pinelands.”⁸ The main provisions of this growth management program as they affect Burlington County are discussed later in this report. Here we anticipate that discussion by simply noting that population growth tended to be much lower in the Pinelands Reserve part of the county during the 1980s and 1990s than in the county’s northwestern section.

Median Household Income and Value of Owner-Occupied Housing

Burlington is a comparatively prosperous county. Its median household income was estimated to be \$68,090 in 2006, and the median value of owner-occupied housing units that year was \$259,300 (Table 1). Moreover, 74.3% of the surveyed homes were owner-occupied in 2006.

³ OMB Bulletin 06-01, 2005, *Update of Statistical Area Definitions and Guidance on Their Uses*, <http://www.whitehouse.gov/omb/bulletins/fy2006/b06-01.pdf> (accessed July 27, 2006).

⁴ Two such examples of metropolitan areas that lost populations and still have nontrivial agricultural sectors (according to the 2002 *Census of Agriculture*) are Broome County, New York (where Binghamton is located), and Allegheny, PA (Pittsburg).

⁵ “Boroughs” are parts of townships that can exercise local government powers on their own.

⁶ Burlington County Department of Economic Development and Regional Planning, 2002, *Burlington County Data Book, 2002 Edition* (Mount Holly, NJ), 45 pp.

⁷ For a description of the Pinelands’ physical environment, as well as two case studies of farming operations there, see Allison Hayes-Conroy, 2005, *South Jersey under the Stars: Essays on Culture, Agriculture, and Place* (Madison, NJ: Farleigh Dickinson University Press), part 1.

⁸ New Jersey Pinelands Commission, *The Pinelands Comprehensive Management Plan (CMP)*, <http://www.state.nj.us/pinelands/cmp/>, p. 1 (accessed July 27, 2006).

Growing Season, Soils, Rainfall, and Water Availability for Agriculture

Growing seasons vary with the crop, but the frost-free period in Burlington County is estimated to be at least 186 days for five years in 10 and a minimum of 166 in nine out of 10 years.⁹ Soil mapping found that 20% of the entire county had “prime farmland soils,” which USDA defines as “land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and that is available for these uses. It has the combination of soil properties, growing season, and moisture supply needed to produce sustained high yields of crops in an economic manner if it is treated and managed according to acceptable farming methods.”¹⁰ The percentage of prime soils rises to 37% in Burlington County’s “farm belt,” which comprises 56,768 acres along the north-south highway US 206.¹¹ Many more acres are productive for particular crops, such as the sandy soils in which cranberries and blueberries are grown.

Rainfall averages about 46 to 48 inches per year in the northern quarter of Burlington County and from 44 to 46 inches to the south.¹² According to Heinrich and Schilling’s 2004 study, rainfall in the county tends to be “fairly evenly spread through the year and especially favorable during the growing season (March through September).”¹³ However, there was a 47.4% increase in the number of irrigated acres—from 9,194 to 13,548 between the 1987 and 2002 federal censuses of agriculture (Table 2). And greater competition for groundwater between urban and agricultural users caused uncertainty as to whether the latter can meet their needs on an ongoing basis.¹⁴

Brief History of Burlington County

Beginning in the 1640s ethnic Finns were “the first European settlers to farm extensively” in what is now Burlington County.¹⁵ Heinrich and Schilling’s search of agriculture census data found that in 1900 there were 2,549 separate farms averaging 135 acres and covering 343,096 acres or about 67% of the county’s total land area.¹⁶ The 1940 census reported 1,847 operations averaging 170 acres, farming 60% of the county’s land area, with the following kinds of crops being the most important in terms of acres planted: vegetables “harvested for sale,” corn, hay, and “tree fruits, nuts, and grapes.” There were also 14,555 cows and heifers “kept mainly for

⁹ Charles Colvard, 2005, *The Environmental Resources Inventory of Haddon Township, NJ* (Haddon Township, NJ: The Haddon Township Environmental Commission): <http://www.haddontwp.com/pdf/HaddonTwpERI2005.pdf> (accessed July 25, 2006).

¹⁰ US Department of Agriculture, Natural Resources Conservation Service, *NSSH Part 622 (00-Exhibit 1)*, Sec. 622.04, <http://soils.usda.gov/technical/handbook/contents/part622.html> (accessed December 15, 2006).

¹¹ Helen H. Heinrich and Brian J. Schilling, 2004, *Agriculture in Burlington County’s Route 206 Farm Belt: Current Industry Status and Trends* (Mount Holly, NJ: Burlington County Office of Economic Development and Regional Planning), p. 19. This three-volume study provides a wide variety of information on Burlington County’s agricultural sector and on various factors shaping its viability.

¹² Spatial Climate Analysis Service, Oregon State University, <http://www.ocs.orst.edu/pub/maps/Precipitation/Total/States/NJ/nj.gif>.

¹³ Heinrich and Schilling, *Agriculture in Burlington County’s Route 206 Farm Belt*, p. 24.

¹⁴ *Ibid.*, p. 26.

¹⁵ *Ibid.*, p. 9.

¹⁶ *Ibid.*, p. 9.

milk production.”¹⁷ Hogs and pigs comprised the next largest group of livestock—totaling an estimated 6,004 animals. Two other very important crops were blueberries and cranberries, grown mostly on sandy soils in what later became the Pinelands Reserve Area.

By the 1987 census the number of farm operations had declined to 834, they averaged 124 acres, and they covered just 20% of the county’s land surface (Table 2).

Table 2. Burlington County: Agricultural Land-Use Traits as Measured by the Federal Censuses of Agriculture				
Traits of the county	2002	1997	1992	1987
Acres in farms	111,237	103,627	97,186	103,224
County’s approximate total land area (in acres)	514,927	514,927	514,927	514,927
Percentage of total county’s land in farms	21.6	20.1	18.9	20.0
Number of farms	906	935	816	834
Average size of farms (acres)	123	111	119	124
Number of farms:				
1–9 acres	240	271 (236)*	188	178
10–49 acres	387	358 (319)*	316	312
50–179 acres	162	175 (169)*	192	206
180–499 acres	55	81 (82)*	74	94
500–999 acres	30	31 (32)*	29	29
1,000 acres	32	19 (19)*	17	15
Percentage of total farms:				
1–9 acres	26.5	29.0	23.0	21.3
10–49 acres	42.7	38.3	38.7	37.4
50–179 acres	17.9	18.7	23.5	24.7
180–499 acres	6.1	8.7	9.1	11.3
500–999 acres	3.3	3.3	3.6	3.5
1,000 acres	3.5	2.0	2.1	1.8
Harvested cropland in acres	58,380	59,654	54,789	52,260
Acres in pasture or grazing	9,269	10,600	8,638	8,204
Irrigated acres	13,548	11,437	8,699	9,194
Percentage of total land in farms leased into farm operations	35.4	41.9	38.0	37.1
Per acre average market value of land and buildings (\$)	6,778	5,331	5,209	3,441

*The numbers in parentheses for 1997 farms by size ranges are from: http://www.nass.usda.gov/census/census97/volume1/nj-30/nj2_01.pdf. The companion acre numbers for 1997 are taken from the 2002 census, which made adjustments for undercoverage in the original 1997 data.

Basic Traits of Agriculture in Burlington County, 1987 to 2002

Major Products: Across the 1987, 1992, 1997, and 2002 ag censuses Burlington County’s four most important census categories of agricultural products by the market values of their sales (Table 3) were:

- nursery, greenhouse, floriculture, and sod;
- fruits, tree nuts, and berries;

¹⁷ US Census Bureau, *Sixteenth Census of the United States: 1940, Agriculture*, vol. 1, *First and Second Series State Reports*, part 1: *Statistics for Counties, Middle Atlantic Division: New York, New Jersey*, http://www2.census.gov/prod/decennial/documents/00179375v1p1_TOC.pdf (accessed December 15, 2006).

- vegetables, melons, sweet potatoes, and potatoes; and
- grains (primarily corn).

Size: In the 2002 census the land in farms added up to 111,237 acres or 21.6% of the county's total land mass. Most of the surveyed farm operations—69.2%—fell in the two size ranges of one to nine acres and 10 to 49 acres (Table 2). Another 17.9% were in the 50- to 179-acre range, but just 12.9% were larger. In 2002 at the national level 32.3% of all farms were recorded as being one to 49 acres in size.¹⁸

Table 3. Burlington County: Market Value of Agricultural Products Sold				
Measures of sales	2002	1997*	1992	1987
Total market value of products—all farms (\$)	83.3 million	88.2 million	64.6 million	55.5 million
Average market value per farm (\$)	91,891	94,323	79,121	66,570
Number of farms	906	935	816	834
Percentage of farms grossing:				
Less than \$2,500	45.8	32.5	29.8	29.6
\$2,500 to \$4,999	8.9	11.7	14.2	12.5
\$5,000 to \$9,999	8.6	10.6	12.4	15.2
\$10,000 to \$24,999	9.7	15.6	15.3	13.7
\$25,000 to \$49,999	6.2	9.6	8.3	9.1
\$50,000 to \$99,999	6.5	6.5	7.6	6.2
\$100,000 to \$249,999	6.5	6.5	5.8	8.4
\$250,000 to \$499,999	3.9	3.2	3.7	3.6
\$500,000 or more	3.9	3.7	2.9	1.7
(Total percentage of sales attributable to farms grossing at least \$500,000)	(64.0)	(64.8)	(57.6)	(45.2)
<i>Market value of total crops including nursery and greenhouse (in thousands)</i>	<i>\$72,869</i>	<i>\$76,440</i>	<i>\$54,702</i>	<i>\$43,900</i>
Selected major products (in thousands):				
Grains	\$5,589 (6.7%)	\$9,394 (10.7%)	\$6,925 (10.7%)	\$4,578 (8.2%)
Vegetables, melons, potatoes, and sweet potatoes	\$10,597 (12.7%)	\$9,063 (10.4%)	\$6,460 (10.1%)	\$5,571 (10.0%)
Fruits, tree nuts, and berries	\$16,890 (20.3%)	\$28,848 (33.0%)	\$17,583 (27.2%)	\$19,240 (34.7%)
Nursery, greenhouse, floriculture, and sod	\$38,350 (46.0%)	\$26,929 (30.8%)	\$22,165 (34.3%)	\$13,026 (23.5%)
Hay, silage, and field seeds (in thousands)	NA	\$1,182	\$1,265	\$1,156
<i>Market value of total livestock, poultry and their products</i>	<i>\$10,384 (12.5%)</i>	<i>\$11,751 (13.4%)</i>	<i>\$9,861 (15.3%)</i>	<i>\$11,619 (20.9%)</i>
Poultry and eggs	\$323	\$1,075	\$953	D
Cattle and calves (in thousands)	\$756	\$648	\$1,730	\$1,954
Milk and other dairy products from cows	\$4,539	\$5,125	\$6,258	D
Hogs and pigs	\$91	\$59	\$184	\$356
Sheep, goats, and their products	D	\$24	\$25	D
Horses, ponies, mules, burros, and donkeys	\$4,368	\$4,660	\$685	\$950
<i>Total value of agricultural products sold directly to individuals for human consumption</i>	<i>\$3,111</i>	<i>\$4,105</i>	NA	NA
Market value of recreational services	D	NA	NA	NA

¹⁸ USDA, 2002 Census of Agriculture, http://www.nass.usda.gov/census/census02/volume1/us/st99_1_009_010.pdf (accessed December 15, 2006).

*The NASS adjusted these 1997 census figures to be compatible with the 2002 Census of Agriculture data. The adjustments were in the form of “reweighting for undercoverage.”

D = “Withheld to avoid disclosing data for individual farms” (p. ix from “Introduction” to *2002 Census of Agriculture: United States: Summary and State Data*).

NA = “Not available or not published” (see note above).

Markets for Burlington County’s Farmers: Burlington’s farmers (as well as those in three of our other study counties—Carroll County, Maryland, northwest of Baltimore, Berks County across the Delaware River in Pennsylvania, and Orange County just northwest of New York City) are located in the highly populated Mid-Atlantic Coastal region. One of the expert interviewees for Burlington County told us: “When I first came here 27 years ago, 80% of our production went to wholesalers in New York and Philadelphia. Now 60% comprise direct sales.” One of those direct marketers told us, “We’re located within a four-hour drive of about one-quarter of the country’s entire population, and I have customers who drive that much time to visit my farm market.”

Percentage of Total Farmland that Was Leased into Operations: In 2002 a little more than a third—35.4%—of Burlington County’s total land in farms was “leased into the farm operations” (Table 2). At the national level the corresponding percent for 2002 was similar—37.7%.¹⁹

Market Value of Farmland and Buildings: The reported market value of Burlington County’s farmland and buildings averaged \$6,778 per acre in 2002, up 97% from the 1987 average of \$3,441 (Table 2), reflecting—at least in part—the land’s increased value for development purposes.²⁰

Gross Farm Sales: The Census of Agriculture has regularly asked farm and ranch operators to report the value of their sales. For example, the 2002 Long Form requested “VALUE OF SALES—Report value of agricultural products sold from ‘THIS OPERATION’ in 2002, including the value of the landlord’s share, before marketing charges, hauling, etc.”²¹ In Burlington County the total across all surveyed farms in 2002 was \$83.3 million (Table 3).

Distribution of Gross Sales by Earnings Classes: According to the 2002 census, close to one-half of Burlington County’s total operations—45.8%—reported gross sales of less than \$2,500 (Table 3). The farms in the \$100,000-plus categories aggregated to just 14.3% of all farms, and only 3.9% grossed \$500,000 or more. However, this latter small group of operations (35 out of 906 farms) accounted for a very large share (64.0%) of the total market value of agricultural products sold for 2002 (Table 3). In contrast, the 1987 census found that the 1.7% of all operations with at least \$500,000 in sales reported 45.2% of all sales countywide that year. For 1992 this measure of sales concentration was 57.2%, and by 1997 it had risen to 64.8%.

¹⁹ USDA, *2002 Census of Agriculture*, http://www.nass.usda.gov/census/census02/volume1/us/st99_1_061_061.pdf (accessed December 15, 2006).

²⁰ The “Long Form” of the 2002 Census of Agriculture requested this information: “Market Value of Land and Buildings—Report your best ESTIMATE of the CURRENT MARKET VALUE OF LAND AND BUILDINGS for acres reported in section 1, items 1, 2, and 3, on p. 2” (p. 19). Those items were: “All land owned,” “All land rented or leased FROM OTHERS,” and “All land rented or leased TO OTHERS.”

²¹ The 2002 Census of Agriculture’s “Long Form,” section 14, p. 15.

Public Policy Context

Locus of Land-Use Regulatory Powers: New Jersey state statutes delegate zoning, subdivision regulation, and other development review powers to the township governments, boroughs, and cities, rather than to the county governments. As discussed earlier, Burlington County has 31 townships and nine boroughs and cities. The townships dominate both in the combined share of total county land under their jurisdiction—98.4%—and in their share of the total year 2000 population—92.2%.²²

Role of State Government: New Jersey’s Department of Agriculture has fielded a number of programs to promote viable agriculture in Burlington County—including cash contributions to the purchase of development rights to farmland, a right-to-farm law, and various marketing efforts such as the “Jersey Fresh” program to encourage residents to purchase local farm produce. The state is also involved in Burlington County by managing growth in the Pinelands region and the availability of groundwater for agricultural use.

Section III: Viability of the County’s Agricultural Sector at the Time of the Case Study (2005–2006)

A general definition of “viability” is “capable of working, functioning, or developing adequately”; and a more specific one for business enterprises is the state of being “financially sustainable.”²³ Combining these two definitions, we classify a county’s agricultural sector as “viable” when there is a significant number of farm and/or ranch operations that are financially healthy and give promise of continuing for some years into the future. The Census of Agriculture provides us with several indicators that are directly or indirectly related to this definition:

- number and size of agricultural operations in acres and gross revenues,
- diversity of agricultural goods and services being produced,
- relative importance of high-value agricultural products,
- percentages of operations reporting net financial gains and losses,

The Census of Agriculture does not publish at the county level measures of profitability by type of operation (e.g., vegetable producer, sod farmer, etc.). However, the censuses did find that certain agricultural products in Burlington County increased in acres harvested or livestock inventoried. We hypothesized such growth reflected farmers’ experience of, or expectations for, profitability. For confirmation we rely on our interviews with agricultural leaders and individual operators in each county, as well as on responses to our landowner surveys in the studied counties.

²² Burlington County Department of Economic Development, *Burlington County Data Book, 2002 Edition*, p. 45.

²³ Merriam-Webster ONLINE, <http://www.m-w.com/dictionary/viability> (accessed September 23, 2006).

Section IIIA: Viability of Farming Operations as Indicated by the Numbers, Sizes, Gross Revenues, and Products of Burlington County Farms

The censuses' estimated numbers of separate farm operations for Burlington County increased somewhat (8.6%) between 1987 and 2002—from 834 to 906 (Table 2). The average size remained virtually unchanged at 123 to 124 acres (Table 2). Almost all the increase in numbers was registered in the two smallest size ranges of 1 to 9 acres and 10 to 49 acres and may in part represent changes in sampling methods. Between the 1997 and 2002 censuses, responsibility for the survey was switched from the US Department of Commerce's Census Bureau to USDA's National Agricultural Statistics Service (NASS).

The published data for 2002 included adjustments for some of the 1997 figures. Comparisons between the original and revised entries for 1997 suggest that improvements in coverage were concentrated among the smaller operations.²⁴ Regarding the financial viability of small-size operations, the experts on Burlington County's agriculture whom we consulted via interviews had mixed opinions. Some of the new small farms were regarded to be no more than large-lot rural home sites producing little, if any, more than the small amount of farm sales required to be eligible for preferential property-tax assessment.²⁵

Some support for this interpretation comes from the time series in Table 3 on the numbers of farms grossing less than \$2,500. Between the 1987 and 2002 censuses, the estimated farm operations in this category increased by more than 150. Between the 1997 and 2002 censuses, which were conducted by the same agency (NASS), the recorded increase was from 304 to 415 or 36.5%.

Some interviewees reported that small farms might be profitable, grossing adequate to very good income from direct marketing and/or specialty crops. One knowledgeable source said, "We have a whole bunch of part-time farmers who can't compete in wholesale markets because of lack of volume and steadiness of supply, but they turn to tailgate marketing. They are growing in leaps and bounds."

Since the public does not have access to the census's farm-level data, we could not determine how many of the small-in-size operations it enumerated were also small in revenues. Our own farmland-owner survey in Burlington County included 24 cases of operator-owners reporting

²⁴ The column for 1997 in Table 2 has in parentheses the numbers of farms by acreage ranges published in the original 1997 census, while the values without parentheses represent NASS adjustments made in that year's numbers. The differences in the classes "50 to 179" acres," "180 to 499 acres," "500 to 999 acres," and "1,000 acres and above" were zero to just six farms. Therefore, it seems likely that real growth in numbers of operations from 1987 to 2002 was limited to perhaps 17 more farms in the largest acreage category—1,000 acres or more—and to maybe about 73 combined in the ranges "1 to 9" and "10 to 49" acres. If we assume that the 1987 figures per range were understated by the same percentage as found for the 1997 data, we can increase the 1987 values by the adjustment coefficient for 1 to 9 acres (1.148) and for 10 to 49 acres (1.122) and then compare the new numbers—204 and 350 farms, respectively—to the corresponding values found for 2002.

²⁵ The relevant statute requires that "gross sales of products from the land must total \$500 per year for the first 5 acres, plus \$5 per acre for each acre over 5, except in the case of woodland or wetland where the income requirement is \$.50 per acre for any acreage over 5." *NJ Taxation*, "General Assessment Issues": <http://www.state.nj.us/treasury/taxation/index.html?lpt/exam.htm~mainFrame> (accessed September 23, 2006).

that they farmed fewer than 10 acres. Sixty-seven percent of this group stated that they grossed in 2005 less than \$10,000, while 12.5% reported being in the range of \$10,000 to \$49,999, and 12.5% with \$50,000 and over (Table 4). Although these cases are of course too few to generalize, they do suggest that small size in acres is not an insurmountable barrier to significant earnings.

Gross sales ranges	Frequency	Percentage
Less than \$10,000	16	66.7
\$10,000 to \$49,999	3	12.5
\$50,000 to \$99,999	2	8.3
\$100,000 to \$449,999	0	0
\$500,000 and above	1	4.2
Missing data on sales	2	8.3
Total	22	100.0

Gross Farm Sales Countywide: At the county level, the censuses indicate that the market value of Burlington County’s agricultural production grew by 50% between the 1987 and 2002 censuses—from \$55.5 million to \$83.3 million (Table 3). That increase almost kept up with the rise, during the same time period, in the consumer price index for the metro area to which the county belonged—58.3%.²⁶

Distribution and Diversification of Agricultural Sales: Besides the above-mentioned *increases* in the number and relative frequency of the very smallest operations (earning less than \$2,500), the percentage shares of all the other ranges of earnings *declined* between 1987 and 2002 except for the two largest in dollar value, \$250,000 to \$499,999 and a half million or more (Table 3).²⁷ As discussed earlier, the share of total sales, countywide, reported by the largest operations (grossing \$500,000) increased very substantially between the 1987 and 2002 censuses—from 45.2% to 64.0% (Table 3).

Other important changes included the higher gross earnings for two agriculture census categories of farm products that can benefit from nearby urbanization: (1) vegetables, melons, potatoes, and sweet potatoes and (2) nursery, greenhouse, floriculture, and sod. New Jersey growers of vegetables and other produce may bypass wholesalers and sell at better prices directly to the expanding urban and suburban populations. Producers of sod, shrubs, trees, and other plantings required for landscaping new homes, schools, golf courses, and so on, also face a growing market where they enjoy a transportation advantage.

²⁶ US Department of Labor, Bureau of Labor Statistics, data for the Consumer Price Index, adjusted so that the base year is 1987.

²⁷ Data for the 2002 Census of Agriculture came from the website of USDA’s National Agricultural Statistics Service, http://www.nass.usda.gov/Census_of_Agriculture/index.asp (accessed September 23, 2006). Table 3’s 1997 data came from both this NASS site and Cornell Library’s site for the 1987, 1992, and 1997 censuses of agriculture, <http://www.agcensus.mannlib.cornell.edu/> (accessed September 23, 2006). All comparisons between the 1987 and 2002 censuses derive from data found in both of these websites.

Between the 1997 and 2002 agricultural censuses, Burlington County's dollar value of sales for the category of vegetables, melons, potatoes, and sweet potatoes, increased by 90%. The corresponding rise for nursery, greenhouse, and related products was 194% (Table 3). According to the 2002 census, the four most important crops (in harvested acres) of the first type were sweet corn, pumpkins, snap beans, and tomatoes (Table 5). Among the "landscaping" group of products, the top four that year were sod, nursery stock, cut flowers, and Christmas trees (Table 5). For these two groups of products, sizable increases in acres harvested between the 1987 and 2002 censuses were recorded for:

- sod (climbing from 1,493 to 4,546 acres),
- nursery stock (from 659 to 1,702 acres),
- snap beans (from 101 to 437), and
- pumpkins (from 246 to 438 acres—see Table 5).

Sweet corn's reported aggregate acres declined from 2,120 to 1,484, and acres in tomatoes dropped from 663 to 429 (Table 5). However, total land harvested for vegetables was virtually unchanged—at over 4,500 acres. Land in blueberry production dropped by more than 1,350 acres, but harvested acres for that sector's most important berry crop, cranberries, remained almost the same—at just below 3,000 acres. Overall, acres harvested for berries in 2002 were 5,774, not much below the 1987 mark (Table 5). In contrast, total acres for nursery crops, greenhouse crops, floriculture, and harvested sod grew by 220% to 7,156 acres (Table 5). On the other hand, acres for hay, silage, and related products diminished by 24%—from 9,898 to 7,509 acres. Hay and straw can fetch good prices in urbanizing areas because of growing numbers of both pleasure horses and also of construction sites that use straw mulch to prevent erosion.

Usually, it is preferable to have a more diversified agricultural sector, so that if one major crop's yields or prices decline, it is more likely that at least one or more of the other important crop or livestock products will do well. According to the 2002 census, Burlington County was somewhat more dependent on the top two groups of products in that year compared to 1987. Nursery and related products accounted for 46.0%, and fruits, tree nuts, and berries for another 20.3%, for a total of 66.3% (Table 3). Fifteen years earlier the rankings were reversed, with the respective shares 23.5% and 34.7%, summing to 58.2%. Livestock's share dropped by 8.4 percentage points, and berries' share by 14.4 points (Table 3). The relative position of grains decreased marginally, while that of vegetables improved slightly. However, for reasons discussed above, it might be argued that an urbanizing county is better off with more of its agricultural revenue derived from landscaping crops and vegetable production. Moreover, livestock operations—with their odors and manure disposal problems—tend not to be compatible with nearby residential development. And profitable grain production tends to require large acreages, which of course are difficult to sustain when urbanization causes land values to climb. Lastly, landscaping products and the ready-to-eat produce are considered "high-value" agricultural goods.²⁸

²⁸ "High-value (value-added) 'consumer-oriented' agricultural products [e.g., fruits, vegetables, greenhouse and nursery products] require little or no additional processing and are generally ready for final consumption at either the food retail or food service level." *FAS ONLINE*, "BCIO Background and Contacts," <http://www.fas.usda.gov/reports/bico/about.htm> (accessed September 23, 2006).

Table 5. Significant* Crops by Number of Harvested Acres, 2002 and 1987, as Recorded by the 2002 and 1987 Censuses of Agriculture		
Groups of crops and individual crops	Harvested acres 2002 (Number of farms growing each crop)	Harvested acres 1987 (Number of farms per crop)
Vegetables, melons, potatoes		
Sweet corn	1,484 (49)	2,120 (81)
Pumpkins	438 (57)	246 (54)
Snap beans	437 (16)	101 (32)
Tomatoes	429 (69)	663 (83)
Total harvested acres for vegetables	4,548 (116)	4,519 (160)
Nursery, greenhouse, floriculture, and sod		
Sod	4,546 (16)	1,493 (8)
Nursery stock**	1,702 (102)	659 (74)
Cut flowers**	787 (23)	16 (5)
Christmas trees	780 (NA)	NA
Total harvested acres for nursery, greenhouse, floriculture, and sod**	7,156 (181)	2,233 (129)
Fruits, tree nuts, and berries		
Cranberries	2,972 (32)	3,070 (36)
Blueberries	1,341 (79)	2,710 (133)
Peaches	281 (23)	619 (40)
Apples	234 (28)	567 (40)
Total harvested acres for fruits, etc.	5,774 (131)	5,940 (182)
All harvested hay	7,175 (176)	8,648 (NA)
All haylage, grass silage, and green chop	334 (11)	1,250 (22)

*The crops included in this table were harvested from at least 100 acres in either 1987 or 2002.

**Includes both "acres in the open" and greenhouse acres, that is, "square feet under grass or other protection" converted to acres.

NA = Not available.

Percentage of Total Operations with Profits

The entries in Table 6, which were based on Census of Agriculture findings from 1987 to 2002, show that most Burlington County farmers did *not* report profitable operations. Across those four censuses, less than half of total farms—47.3% to 48.8%—were profitable except for a modest spike in the 1997 census (to 56.9%). Since the censuses do not provide, at the county level, profitability data by product type or size of farm operation, we must turn to our own research findings.

Table 6. Profitability of Farming in Burlington County as Measured by Censuses of Agriculture				
Indicator	2002	1997	1992	1987
Total farm operations	906	856	817	834
Percentage of total operations with net gains	47.6	56.9	47.3	48.8
Percentage with losses	52.7	43.1	52.8	51.2
Average net gain per farm (\$)	66,784	58,792	37,476	36,482
Average net loss per farm (\$)	13,850	13,448	9,129	8,709

Profitability by Type of Product and Marketing Strategy

Interview data do support what is suggested by the census's time series on market sales for vegetables and landscaping-type operations (as well as the acreage data on the latter).

Many operators in those two sectors appear to have been doing well, as have at least some of the fruit growers and hay farmers. Included among the farmers observed to be financially successful were producers for ethnic markets.

- “Sod, nursery, and hay are among the best crops now in their financial returns,” said a manager of a local agri-service business in an interview.
- “Fruits and vegetables have a competitive advantage here—near to a wealthy, concentrated population,” said a university researcher.
- “Nursery farmers, blueberries, and vegetable growers tend to be pretty consistent, depending on management and marketing,” said a financial expert.
- “We have an excellent market for straw. It’s used as mulch for construction. And horses offer a specialty market for precut rye; we mow it green,” said a local farmer.
- “Our hay industry is very strong because of pleasure horses,” reported an agricultural educator.
- “In Springfield [Township] we have oriental operations: two do vegetables (Chinese), one is Korean and markets directly to NYC and sends in a truck almost every day,” said a local agri-service provider.
- “Many growers are now producing Asian vegetables and fruits or products specific to the Hispanic population in the area. They’re up there with the nursery growers,” said another financial expert.
- Expecting to open a new farm market store, an operator explained that he could do it because he “offered 40 different products, including many vegetables, fruits, asparagus, and melons.”
- “A key to making it in this area is diversification. . . . We grow all different kinds of fruits and vegetables. . . . We get an early start with our greenhouses, growing annuals, geraniums, hanging baskets, and so on. We open our farm market Palm Sunday, generally at the end of March, and stay open until Christmas,” said another local farmer.
- “We made it happen. Didn’t have other jobs; we had a lot of lean years. We changed from wholesale, with some years making money and others not. Now we have a mix of enterprises: production of vegetables and fruit, a farm market with a very large agritourism component, including hayrides to pick-your-own locations on the farm, and a petting zoo and picnic area,” said a third farmer.

As the last three comments indicate, the choice of marketing strategies may be as important as decisions regarding the mix of products grown. The relatively large population of Burlington County and its neighboring counties (Table 7) made direct marketing an attractive option.²⁹ The last comment above testifies to the potential profits from agritourism enterprises attached to the farm operation. Direct marketing, however, was already important. Burlington County’s total “value of sales of agricultural products sold directly to individuals for human consumption” of \$3.1 million, reported in the *2002 Census of Agriculture*, was the highest in the state. Its total for 1997, \$4.1 million, ranked the county fifth in the nation.³⁰

²⁹ See Hayes-Conroy, *South Jersey under the Stars*, part 2, for a discussion of the evolution of farm markets in South Jersey.

³⁰ Heinrich and Schilling, *Agriculture in Burlington County’s Route 206 Farm Belt*, 14.

Table 7. Population of Burlington County and Surrounding Counties	
County and state	Estimated 2005 population
Mercer County, NJ	366,256
Monmouth County, NJ	635,952
Ocean County, NJ	558,341
Atlantic County, NJ	271,015
Camden County, NJ	518,249
Bucks County, PA	621,342
Philadelphia County, PA	1,463,281
Burlington County, NJ	450,743
Total	4,885,179

Source: US Census Bureau, *State and County Quick Facts*. <http://quickfacts.census.gov/qfd/index.html>

Section IIIB: Marketing Outlets for Burlington County’s Agricultural Products

A likely necessary condition for the survival of a significant agricultural sector in any county is that producers continue to find satisfactory marketing outlets for what they raise. Among the 140 farmland owners who completed questionnaires in Burlington County, all reported that they had land in the county that was farmed during 2005. Ninety-five respondents were operators of at least some of that land, and another 20 reported not being operators themselves but having “detailed information about how my farmland there is operated.”³¹

A brief profile of those two groups, totaling 115 surveyed owners, is presented in Table 8. About the same percentages reported wholesale marketing (41.7%) as direct marketing (42.6%). For livestock or crops raised on owned land, horses, grains, and hay were the most frequently mentioned (34.8%, 31.3% and 27.0%, respectively). The 95 farm owner-operators in this group had somewhat larger operations than those measured for the county as a whole by the 2002 Census of Agriculture. While 46.3% of the 95 had less than \$10,000 in gross sales for 2005, the corresponding percentage from the census was 63.3% (Table 3). The difference for the total percentage of operations with at least \$50,000 in gross sales was 26.3% of our sample versus 20.8% in the census.

³¹ Early in the survey—question #13—all respondents were asked to classify themselves as (1) “I am an operator of at least some of the farmland I own in Burlington County,” or (2) “I am not the operator of any of my land there, but I have detailed information about how my farmland there is operated,” or (3) “I am not an operator, and I do not have detailed knowledge of how my farmland there is operated.” Those respondents choosing the third option were directed to skip to the last section of the survey, thus missing the groups of questions about which crops or livestock were raised on their land in 2005, how the land’s products were marketed, how adequate were the supplies of inputs for farming, and other issues presumably beyond their knowledge base.

Types of marketing* and ag products on their owned land	Percentage of 115 respondents	Age and other traits of 115 respondents and 95 operators	Measured value
At least some wholesale marketing	41.7	Operators and knowledgeable non-operators = 115	
Some direct marketing	42.6	Average age	56.7
Vegetables	15.7	Percentage with college degree	45.2
Fruits	17.4	Number living on or next to owned agland	87.8
Nursery, sod, etc.	11.3	Operators only = 95	
Grains	31.3	Number farming as “principal occupation”	36.8
Hay	27.0	Percentage of full-time farmers	40.0
Woodland crops	21.7	Percentage with less than \$10,000 in gross sales for 2005	46.3
Hogs	3.5	Percentage with \$10,000 to \$49,999	16.8
Dairy	1.7	Percentage with at least \$50,000	26.3
Beef cattle	7.0	Percentage with \$100,00 or more	16.8
Horses	34.8	Average number of years farming	20.8
Sheep	7.0	Average percentage of household income from farming	22.5

*The marketing questions were asked about each respondent’s entire operation, not just the land he/she owned in Burlington County.

These 115 operators and “farm-operation-knowledgeable” nonoperator-owners were asked a number of questions about the agricultural operations on their land in the year 2005, including how crops or livestock were marketed and how satisfied they were with the “accessibility, competitiveness, and profitability of marketing outlets for your farm goods.”

Table 9 presents the responses given by the 115 operator-owners and “informed” nonoperator-owners to the three-part question about satisfaction with the marketing outlets available to them:

Response options	Accessibility (%)	Competitiveness (%)	Profitability (%)
Very satisfied	18.3	9.6	6.1
Moderately satisfied	15.7	13.0	13.0
(Either “very” or “moderately” satisfied)	(34.0)	(22.6)	(19.1)
Somewhat satisfied	20.8	22.6	27.0
Not at all satisfied	8.7	13.0	16.5
Not sure	15.7	18.3	14.8
Did not answer	20.8	23.5	22.6
Number of respondents	115	115	115

*Owner-operators and nonoperator-owners with knowledge of farm operations on their land were asked, “Overall, in 2005 how satisfied were you with the accessibility, competitiveness, and profitability of marketing outlets for your farm goods?”

These responses suggest only modest satisfaction with marketing opportunities. Regarding “accessibility,” 34% were either “very” or “moderately” satisfied. The corresponding combined

percentage for “competitiveness” is 22.6%, and for profitability, 19.1%. If we limit this analysis just to the 95 operator-owners, the three percentages climb somewhat—to 36.8% for accessibility, 24.2% for competitiveness, and 22.1% for profitability.

We used logistic regression analysis to look for determinants of these measures of satisfaction with marketing outlets.³² Our hypotheses stated that respondents’ evaluations of their markets’ *accessibility* vary with the percentage of their total 2005 sales achieved through direct marketing, with the percentage of total sales transported to points of sale “within a one-hour trip from your farm,” and with the respondents’ ages. We assumed that older farmers found market accessibility more difficult, other things being equal. The statistically significant regression findings were that, other things being equal,

- the higher the percentage of the operation’s gross sales transported to points of sale within an hour’s trip, the *more* likely the respondent was at least moderately satisfied with accessibility,³³ and
- the likelihood of being pleased *increased* also with the level of the respondent’s gross sales.
- Various measures of the role of direct marketing and wholesaling³⁴ did *not* affect the likelihood of satisfaction.

Qualifying Comments

There are likely to be significant causes of satisfaction that our comparatively short questionnaire (9 pages) did not measure. Another limitation is the small number of cases included in the analysis—115 or fewer, depending on which groups of owners are included in the analysis. With a larger sample, more hypothesized causal variables might have been statistically significant. However, in this regression analysis and the several others presented later in the chapter, the relationships we report are unlikely to be due to random factors.³⁵

In our analysis of the likelihood of being at least “moderately satisfied” with the markets’ *competitiveness*, we used the same three hypotheses already mentioned and added ones about the total acres farmed, overall gross farm sales, and the types of marketing outlets used in 2005 and the types of farm products raised on owned land that year.³⁶ Regarding farm products, we had nontrivial numbers of respondents (at least a dozen for each type of product) reporting their land being used for raising vegetables, fruit, nursery crops, grains, woodland crops (like Christmas

³² For a very readable source on this statistical tool, see Scott Menard, 2002, *Applied Logistic Regression Analysis*, 2nd ed. (International Oaks, CA: Sage Publications), 111 pp.

³³ To qualify as a significant determinant of the likelihood of the respondent being at least “moderately satisfied,” an independent variable had to be statistically significant in a Wald test at the 0.1 level or better.

³⁴ These variables were the total percentage of sales marketed wholesale, the percentage marketed directly, whether all sales were wholesale or all were direct, the percentage marketed from the farm (i.e., via a stand or pick-your own), or whether the respondent had any direct marketing sales at all, or any wholesale sales at all, whether the respondent had more than 50% of total sales marketed directly, and more than 50% marketed wholesale.

³⁵ The probability of the relationship being due entirely to chance factors is estimated to be no greater than 10%, as indicated by a Wald test of statistical significance.

³⁶ In an already long questionnaire, we chose not to include separate questions about the types of crops and livestock raised on rented land or any land farmed outside the studied county. However, the questions about total acres farmed, gross sales, percentage of household income derived from farming, and marketing outlets focused on the total operation in 2005.

trees), and horses. The only statistically significant relationships we found were that, other things being equal,

- having nursery, greenhouse, and related crops on the respondents’ owned land in Burlington *increased* the likelihood of being satisfied,
- as did having an adequate supply of nonfamily workers for the farm operation.

For explaining the likelihood of being at least “moderately satisfied” with the *profitability* of market outlets, we tested for the effects of the same hypothesized causal variables. In this round of regression tests,

- having nursery, greenhouse, and related crops *greatly increased* the likelihood of being satisfied, as did raising only fruits, while
- reporting any direct marketing *lowered* the likelihood.

Groups of respondents	Very satisfied	Moderately satisfied*	Somewhat satisfied	Not at all	Not sure or no response
Nursery, greenhouse, etc., production on one’s land (<i>n</i> = 13)	7.7	46.2 (53.9)	15.4	23.1	7.7
Hay production (<i>n</i> = 31)	9.7	3.2 (12.9)	25.8	12.9	48.4
At least some sales through direct marketing (<i>n</i> = 49)	6.1	10.2 (16.3)	38.8	20.4	24.4
At least some sales through wholesaling (<i>n</i> = 48)	8.3	22.9 (31.2)	31.3	18.8	18.7
All operator-owners and nonoperator-owners who report having detailed information about how their land was farmed (<i>n</i> = 115)	6.1	13.0 (19.1)	27.0	16.5	37.4

*The percentages in parentheses represent the sum of the two response options “very satisfied” and “moderately satisfied.”

Surprising was the small percentage of direct marketers in our sample who were satisfied with their outlets. Just 16.3% reported being “very” or “moderately” satisfied (Table 10). The level of satisfaction did *not* significantly vary by the respondent’s gross sales, percentage of total sales sold directly, or other measures of direct marketing.

Programs Operating in Burlington County to Promote Marketing Opportunities

Our interviews with agricultural leaders in the county yielded information on the following programs to promote marketing opportunities for farmers:

- The New Jersey Department of Agriculture’s program that enables qualifying farmers to market their produce under the “Jersey Fresh” brand, which certifies that they have met quality standards set by the state. This program encourages sales also through state funds that advertise the brand.
- That same department’s list of farmers’ markets operating in Burlington County and other parts of the state.

- That department’s website that invites viewers to use its links to “search for pick-your-own farms, farmers markets, community farmers markets, hay rides, corn mazes, farm tours and other activities.”³⁷
- Cooperative Extension’s efforts to disseminate information about farmers producing hay and straw for equine customers and other buyers.
- An equine association’s lists of farms that breed horses, train, board, and/or offer riding lessons.
- Cooperative Extension meetings that informed farmers about opportunities to diversify their vegetable crops.
- The Burlington County Research and Demonstration Greenhouses, funded by the county government and the New Jersey Economic Development Authority, which provide space and technical assistance to incubate value-added agricultural businesses.

Our survey of agricultural landowners included questions to determine (1) if respondents were aware of assistance programs operating in the county with the objective of improving operations’ marketing or their mix of enterprises (e.g., adding products or processing existing ones) and (2) what opinions (if any) the surveyed owners had about those programs. For each of the seven types of possible assistance programs listed in Table 11, most of the respondents—59.1% to 78.2% of them—either chose the option “not sure” or offered no response at all. Also, another 2.6% to 7.0% believed that no such program was in operation in the county. In fact, as indicated in the list of programs given above, there were programs in place. But apparently very few were visible to more than minor percentages of the potential clientele represented by the 115 respondents to this part of the questionnaire. Three of the four highest combined percentages of the answers “very useful” and “moderately useful” were for programs for marketing directly to consumers (23.5%), for marketing directly to retail outlets like stores and restaurants (17.4%), and for developing new agricultural enterprises such as agricultural tourism (18.2%).

³⁷ “New Jersey Agri-Tourism Events and Attractions,” <http://www.state.nj.us/jerseyfresh/agritourismhome.htm> (accessed March 19, 2007).

Possible assistance program operating in the county	No such program in county (%)	Very useful (%)	Moderately useful (%)	Somewhat useful (%)	Not at all useful (%)	Not sure or did not respond (%)
Marketing directly to consumers	7.0	13.9	9.6	7.0	3.5	59.1
Marketing directly to retail markets (stores, restaurants)	6.1	7.0	10.4	4.3	7.0	65.2
Marketing to wholesale markets	3.5	7.0	11.3	9.6	7.0	61.8
Developing other ag enterprises (e.g., ag tourism)	4.3	13.0	5.2	7.0	4.3	66.1
Diversifying or adding new products	2.6	9.6	2.6	6.1	10.4	68.7
Developing value-added products (bagging, packaging, bundling, pre-cutting, etc.)	3.5	4.3	2.6	2.6	8.7	78.2
Processing crop or livestock products the farmer raises	7.0	3.5	3.5	6.1	4.3	75.7

Possible assistance program operating in the county	Yes** (%)	Maybe (%)	No (%)	Not sure or no response (%)
Marketing directly to consumers	41.7 (43.2)	20.0	3.5	34.7
Marketing directly to retail markets (stores, restaurants)	45.2 (46.3)	13.0	5.2	35.6
Marketing to wholesale markets	40.9 (42.2)	18.3	6.1	35.0
Developing other ag enterprises (e.g., ag tourism)	41.7 (42.1)	13.9	7.8	36.5
Diversifying or adding new products	40.9 (42.1)	20.0	3.5	35.7
Developing value-added products (bagging, packaging, bundling, pre-cutting, etc.)	31.3 (33.7)	20.9	6.1	41.7
Processing crop or livestock products the farmer raises	33.9 (36.8)	17.4	6.1	42.6

*Text of question: "Whether or not these programs are operating in the county or functioning effectively, do you believe that in Burlington County there *should* be programs to assist farmers with [name of specific assistance program]?"

**Percentages in parentheses are based on the responses of the 95 owner-operators.

In contrast, when our survey's questions switched from asking about current programs to inquiring whether such assistance to farmers "should be" available in the county, sizable percentages (though less than majorities) answered "yes." The first five programs listed in Table 12 received support from 40.9% to 45.2% of the respondents. The percentage responding "yes"

increased only slightly when we limited the analysis to the 95 owner-operators (see the “yes” values in parentheses in Table 12). None of the seven types of programs stands out in the sense of having a majority of the respondents endorsing it as needed in the county. Moreover, with three exceptions, all of the “yes” percentages (values in parentheses) in Table 12 are close enough to one another (e.g., 41.7% versus 40.9%) that the small percentage-point differences could be due entirely to random causes.³⁸

The lack of clear distinctions may result from all seven types of programs aiming at the same general goal—to help farmers improve their market income. Among our Burlington County sample, support for that goal was rather high if we measure it in this alternative way. Among the 115 owners invited to answer these questions about the seven programs, 60% endorsed *at least one*; 52.2%, at least two of them; and 44.3%, three or more.

Section IIIC: Inputs of Production: Farmland—Quantity, Affordability, and Agricultural Land Preservation Programs

Besides satisfactory marketing outlets, another likely necessary condition for a viable agricultural sector is the perception by “enough” farmers that they have access to adequate supplies of the inputs for production: land, credit, labor, fertilizers, pesticides, equipment and implements (sales, parts, repairs), and water.

Land for Farming and Contributions of Farmland Preservation Programs

We investigated three general aspects of the supply of land for farming in Burlington County:

- its quantity,
- affordability to purchase or to rent, and
- the contributions to the supply of land for farming made by county-level and other farmland preservation programs.

Quantity: As discussed earlier in this report, the total acres in farms reported in the agriculture censuses increased somewhat over the 15-year period 1987 to 2002, as did the harvested cropland acres and land in pasture or grazing (Table 2). The county’s population was also growing—by an estimated 14.1% between 1990 and 2006. However, we encountered stories about entire farms being converted to housing in recent years. Moreover, over the 15 years the number and relative importance of small-in-acres farm operations increased. By the time of the 2002 census, 26.5% of all farm operations were estimated to be in the range of 1 to 9 acres and a total of 69.2%, 1 to 49 acres (Table 2). Still, the farms of medium-to-large size operations—180 acres or more—were not insignificant in numbers (117 operations) or total acres. Their land aggregated to 87,428 acres or about 137 square miles and 78.6% of all farmland in the county.

Affordability of Land to Purchase: Our landowner survey asked, “In 2005, on the whole how affordable to you (or the operator of your land) was the farmland that came on the market in Burlington County for purchase [and] for rent?” Table 13 presents the findings by three groups of respondents. Whether we look at:

³⁸ The value for “Developing value-added products” (31.3%) is statistically significantly less than those for “Marketing directly to consumer,” “Marketing directly to retail markets,” and “Developing other ag enterprises.”

- all owner-operators plus those additional owners who believed they had “detailed information” about how their land was farmed ($n = 115$),
- operators only ($n = 95$),
- those operators with at least \$50,000 in gross sales ($n = 25$), or
- those with \$100,000 or more (16),

the distributions of opinion varied little. Just 12.0% to 15.8% found the farmland for sale that year “on the whole very affordable” or at least “affordable” (see the percentages in parentheses in Table 13).

Groups of respondents	On the whole very affordable (%)	Affordable* (%)	Not very affordable (%)	Not at all affordable (%)	Not sure or no response (%)
All operator-owners and also nonoperator-owners who reported having detailed information about how their land was farmed ($n = 115$)	4.3	10.4 (14.7)	25.2	30.4	29.6
Operators only ($n = 95$)	5.3	10.5 (15.8)	26.3	30.5	27.4
Operators reporting at least \$50,000 in gross sales for 2005 ($n = 25$)	0.0	12.0 (12.0)	36.0	32.0	20.0
Operators reporting at least \$100,000 in gross sales for 2005 ($n = 16$)	0.0	12.5 (12.5)			

*The percentages in parentheses represent the sum of the two response options “On the whole very affordable” and “Affordable.”

Our interview sources tended to agree:

- “None of our farmland sells for its agricultural value because of too much speculation as to what it will be worth. Even the deed-restricted land [i.e., with the development rights purchased from the owner] will go higher,” said an agricultural educator.
- “People are bringing their money from northern New Jersey and Long Island to buy land here for \$20,000 an acre. The average loan is now more than 1 million dollars,” said an expert on agricultural finance.
- “Let’s say that the farmland is worth fifty to seventy thousand an acre, and the farmer has a son farming with him. There’s always the knock on the door from a developer, and if it’s a bad year for grain, the land will be sold and developed,” said a large grower.
- “There is absolutely no way that a small grain or hay farmer can afford to buy land that their operations can sustain. People who produce vegetables and landscape can buy land, most probably that is already protected,” said a manager of an agri-service business in the county.

Affordability of Deed-Restricted Land through Purchase or Transfer of Development Rights:

Exceptions to the trend toward unaffordable farmland prices could be the parcels shorn of their development rights and thus not available for housing subdivisions or some industrial or

commercial use. However, a concern articulated by New Jersey’s State Agricultural Development Committee is that farmland with deed restrictions on development—either through purchase or transfer of development rights—may also become too expensive for farmers to buy:

“The value of farmland after the development rights have been removed continues to rise statewide, with the greatest increases in areas on the fringe of development. These high values, bolstered in part by housing opportunities associated with the land [i.e., the right to build one or more additional homes or to enlarge or replace an existing farm house], can price farmers out of the market for preserved land. . . . Wealthy individuals interested not in farming but in the residential value of the land may find preserved farmland attractive for its ‘estate’ value.”³⁹

Burlington County Program—Total Acres Preserved: According to Deborah Bowers’s 2007 annual survey of locally operated farmland preservation programs, Burlington County had the largest such program in New Jersey and ranked sixth in the nation, with a total of 49,382 preserved acres or about 77 square miles. A little more than half of that total (25,418 acres) represents land protected through purchase of development rights (PDR). As of August of the previous year, 2006, county funds—supplemented by municipal, state, and federal contributions—had bought the development rights to 214 farms, “totaling 24,000 acres.”⁴⁰ The county government uses a voter-approved property-tax levy of four cents per \$100 of assessed valuation for protecting farmland and other open space. In the November 2006 election, county voters agreed by a margin of 3 to 1 to extend the life of that levy until 2036.⁴¹ This voter support occurred despite, or perhaps because of, a sharp escalation in the average cost of preserving an acre of Burlington County farmland through PDR—from \$3,500 in 1998 to \$10,500 in 2006.⁴²

Degree of Contiguity Achieved: Besides preserving a large quantity of farmland, Burlington County’s program is notable for another, related achievement. Most of the protected parcels are contiguous with other protected land rather than being isolated tracts. Stand-alone parcels may be more expensive to farm (e.g., farther for farm equipment to travel) and/or more vulnerable to the constraints resulting from non-farmer neighbors’ complaints.

An April 2007 map prepared by the county’s Department of Resource Conservation shows (by our count) a total of 308 separately demarcated parcels or groups of parcels (under common ownership), of which 29 had been protected through Chesterfield Township’s transfer of development rights program (TDR) and most of the remainder through the county’s PDR program. As will be discussed later Lumberton Township also had TDR, but it was not clear from the map which of that township’s parcels were PDR or TDR in status.⁴³ However, among

³⁹ New Jersey State Agricultural Development Committee, 2004, “Recommendations of the New Jersey Farmland Affordability/Availability Working Group” (Trenton, NJ), p. 2.

⁴⁰ Burlington County (NJ) press release, “Burlington County Voters to Decide Future of Farmland and Open Space Program,” Mount Holly, NJ, August 23, 2006, 2 pp.

⁴¹ “Record \$5.7 Billion for Land Conservation,” *Farmland Preservation Report* 17 (November–December 2006), p. 3.

⁴² Burlington County press release, “Burlington County Voters to Decide.”

⁴³ Communication from the Burlington County Department of Resource Conservation, November 2007. The department should not be blamed for any errors in this analysis. We did the counting of tracts per program and the identifying of contiguous parcels and of clusters. Our source was: Burlington County Department of Resource

the 308 cases, seven in ten (70.1%) were adjacent to another separately demarcated parcel or groups of preserved parcels that did *not* have the same owners. This latter qualification makes the contiguity achievement all the more impressive because, if the two or more parcels have the same owner, their contiguity could represent that owner's choice of entering into the county program a single farm that happened to consist of multiple parcels.

Another laudable achievement is the extent to which the map shows large clusters of contiguous protected parcels. Chesterfield Township in the north of the county had a cluster totaling 79 parcels, if included in that count are the PDR parcels next to one or more of its 29 TDR tracts. Only eight of the overall 87 parcels protected by the two programs in Chesterfield were stand-alones. Mansfield Township had a cluster of 15 tracts and Springfield had 13. Achieving contiguity in Burlington County was facilitated by the total number of parcels protected. They provided more opportunities for realizing clusters.

Transfer of Development Rights: In addition to the PDR approach to farmland preservation, considerable acreage has been preserved in Burlington County also through deed restrictions on nonagricultural uses resulting from the transfer of development rights (TDR). Three parts of the county have seen substantial TDR activity: Chesterfield Township, Lumberton Township, and the Pinelands Reserve Area.

Chesterfield Township: Comprising 21 square miles in the extreme north of the county, Chesterfield Township established in 1997 a “voluntary transfer of development rights” program. Through it, a developer who wants to build in a designated 560-acre “receiving area”⁴⁴ at densities higher than allowed by the zoning code can go to owners of land in a “sending area” marked for agricultural preservation and bid on the owners’ “development credits.” The latter are allocated per parcel based on the land’s development potential.⁴⁵ If the owner and the bidder reach agreement, the credits enable the bidder to obtain desired building permits in the receiving area, and the owner gets the money and imposes on his/her land a deed restriction providing that the land “shall be retained for agricultural use and production.”⁴⁶ Through July 2005 a total of 1,429 acres of farmland in Chesterfield had been subject to these voluntary agreements.⁴⁷ For the parcels whose development rights’ sale prices were available to us, the weighted average price per development credit was \$30,424.⁴⁸ In July 2005, one credit was needed to build a detached single-family home and 0.9 credits for a townhouse.

Conservation, http://www.co.burlington.nj.us/departments/resource_conservation/index.htm (accessed May 30, 2007).

⁴⁴ A new settlement called “Old York Village.”

⁴⁵ “Pursuant to N.J.A. 40:55D-115, ‘development potential’ is defined as ‘the maximum number of dwelling units or square feet of nonresidential floor area that could be constructed on a specified lot or in a specified zone under the Master Plan and land use regulations in effect on the date of the adoption of the development transfer ordinance and in accordance with recognized environmental constraints’ [e.g., the soil’s capacity to accept a septic system]” (“Land Development” ordinance 130-129, Chesterfield Township, Burlington County, NJ). For example, one 22.36-acre parcel was awarded 4.25 credits, while a parcel of 19.4 acres received 6.25 credits.

⁴⁶ “Deed of Easement, Restriction and Enrollment” (sample), revised November 29, 2004, 12 pp., Chesterfield Township, Burlington County, NJ.

⁴⁷ “TDR Credit Allocation—Ordinance List” (spreadsheet), July 22, 2005, Chesterfield Township, Burlington County, NJ.

⁴⁸ See the previous footnote.

Lumberton Township: Located in the northwestern part of Burlington County, Lumberton Township covers 13.0 square miles. As of the publication of a statewide report on TDR in June 2007, Lumberton had recorded more than 850 acres as permanently protected through compensation of landowners in the “sending areas” by owners in the designated “receiving areas.”⁴⁹ All the land in the latter was held by developers. The credits thus obtained enabled them to increase residential densities on their land, such as from “0.7 units per acre [without development credits] to a maximum of 4 units per acre.” In the second phase of Lumberton’s TDR program that began in 2000, the number of credits transferred from a sending area parcel was derived from “the number of units that could realistically be constructed on that parcel under existing zoning.” That number was based on the soil’s suitability for septic systems.

Pinelands Reserve Area: Urban-density development is not permitted in the “Agricultural Production Areas” and “Special Agricultural Production Areas”⁵⁰ of Burlington County’s portion of the Pinelands Reserve Area:

“The Pinelands is a very large area [encompassing a total of 1.1 million acres in parts of seven New Jersey counties] containing irreplaceable resources that can easily be destroyed.⁵¹ Because the Pinelands’ sandy soils don’t filter pollutants, water supplies are easily contaminated by septic systems, fertilizers, pesticides, and run-off from heavily traveled roads. These are but a few of the impacts that go along with suburbanization. To prevent this from happening, the Pinelands Plan sets aside sensitive areas where the amount of development is limited and other areas where growth is encouraged.”⁵²

A number of owners of agricultural land in these growth-limited areas of the Pinelands Reserve have been able to receive some compensation for development opportunities lost. Through FY 2007 they sold “Pinelands development credits” (PDCs) to over 29,500 acres that they owned.⁵³ The buyers seek to increase their buildable densities for land they own in one of the nine designated “Regional Growth Areas” (such as near Atlantic City). Each one credit transferred to a growth area “entitles the owner to build four additional housing units.”⁵⁴ The allocations of

⁴⁹ The quotations and other information in this paragraph were found in State of New Jersey, 2007, *N.J. State Transfer of Development Rights Bank* (Trenton, NJ), p. 6.

⁵⁰ The “special” areas have berry agricultural production and related land uses.

⁵¹ These resources included: a 17-trillion gallon aquifer, “54 plant and 39 animal species threatened with extinction in New Jersey”; “the Pine Plains, most extensive pigmy forest of its type in the country”; “over 1,000 known prehistoric sites which show that man lived here as early as 10,000 BC.” Burlington County Library System, *The Pinelands Fact Sheet*, <http://www.burlco.lib.nj.us/pinelands/factsht.shtml> (accessed October 19, 2006).

⁵² New Jersey Department of Banking and Insurance, 2006, *The New Jersey Pinelands: A Success Story*, <http://www.state.nj.us/dobi/pinelands/pinelandssuccess.htm> (accessed October 19, 2006).

⁵³ This total consists of acres in both the “Agricultural Production Area” and the “Special Agricultural Production Area,” State of New Jersey, 2007, *Pineland Development Credit Bank, Annual Report FY 2007*, <http://www.njdoabi.org/pinelandsbank.htm>. “The Pinelands Development Credit program is designed to transfer some of the benefits of increased land values in growth areas back into areas where growth is limited,” Pinelands Preservation Alliance, Summary of the New Jersey Pinelands Comprehensive Management Plan, <http://www.pinelandsalliance.org/Pages/cmp.html> (accessed April 3, 2008).

⁵⁴ See the previous reference (Pinelands Preservation Alliance) in footnote 53.

sellable credits to parcels in the sending areas depend on the development foregone if the land becomes deed-restricted.⁵⁵

When current owners of restricted land wish or need to sell it, who will likely buy it? Will buyers be nonfarmers interested in the land's estate potential, local farmers seeking to improve their operations, or farmers from other parts of the state or out of state who outbid the Burlington County operators? This question was answered, at least in part, in a February 2006 auction of seven protected farm parcels that the Burlington County preservation program had purchased in fee simple because the owners were unwilling to farm them.

According to a county government press release, there were "more than 150 bidders." The successful ones consisted of two farming couples from Burlington County who bought one parcel each, a landscape products farmer from neighboring Monmouth County who purchased two parcels, a fruit grower from Mercer County, also next to Burlington County, who was top bidder for a fifth parcel, and an ethnic vegetable grower (Korean) from Long Island who bought two of the seven farms. A total of 944 acres were sold. The purchase price per acre ranged from \$4,394 to \$10,478.⁵⁶

Does protected land continue to be farmed? The easement agreements to which the county government is part did *not* (as of June 2007) require that the land be farmed, only that it be "available for ag production,"⁵⁷ such as by not having buildings erected on it or not having trees and shrubs growing where crops or pasture used to be. In effect, owners are required only to mow the fields so that they could be tilled or grazed. However, when the county program monitored 152 of its protected farms in 2006, it found no farm out of production: "There were a few fallow fields on individual farms. These farms will only be out of production for a cycle or two for various reasons," said a representative of the program. One good reason for at least some production is that the land will cease to qualify for agricultural use assessment and then see its property-tax bill rise.

Zoning

Restrictive zoning is another potential tool for keeping farmland affordable for farmers to purchase. Sometimes the restrictions are effective, such as via urban growth boundaries that are infrequently and incrementally expanded or through large minimum lot sizes for building permits (e.g., 40 acres) that are not circumvented by rezoning to more liberal minima. Developers and speculators may then bypass the affected land in favor of less restricted land elsewhere in the

⁵⁵ "The amount of credits that would be allocated to a landowner depended on the development potential of the land. For instance, uplands and woodlands were allotted 1 credit per 39 acres. Certain woodlands were allotted 2 credits if they were located above a watershed. Wetlands were given .2 credits per 39 acres because there was not much threat of development in these areas. However, wetlands used in the harvesting of cranberries and blueberries were given 2 credits per 39 acres. When a credit was transferred, it permitted the purchaser to build four residential units above density. In other words, if a developer owns one acre which is currently zoned for 1 unit, he could develop 5 units on the acre after purchasing one credit. If a developer only wished to build one additional unit, he could purchase 1/4 of a credit. Once a landowner sold a credit he would have to record a deed restriction which limited his future use of the property" (Maanvi Mittra, 1996, "The Transfer of Development Rights: A Promising Tool for the Future," Pace Law School, <http://www.law.pace.edu/landuse/tdrpap.html> (accessed October 20, 2006).

⁵⁶ Burlington County Department of Resource Conservation, "Burlington County Auction of Preserved Farmland," press release, February 3, 2006.

⁵⁷ Communication for a representative of the county program, June 2007.

county or region, lessening the upward pressures on the prices of land subject to the restrictive zoning.⁵⁸

With two exceptions, the zoning restrictions do not seem to pose a substantial barrier to development. One exception is the Pinelands Reserve Area discussed above. The other is Springfield Township. It increased the minimum building lot size for rural areas from three acres to 10 and successfully argued in court to deny a developer a sewer line to which he believed he was entitled.⁵⁹ Then in the 2006 primary election three council members who supported the increase in lot size survived challenges from candidates who opposed the lot size change because of claimed loss of market value.⁶⁰ The three went on to win reelection in the fall. The other Burlington County townships interested in farmland preservation seem to rely on compensation programs, either PDR or, in Chesterfield’s and Lumberton’s cases, TDR.

In some counties (like Lancaster in Nebraska), large floodplain areas can be declared off-limits to builders unless compensatory floodwater storage can be found to offset the losses to development. However, in Burlington County’s case, there are “not large contiguous areas of floodplain. Here we have lots of little creeks and low areas that are associated with upland areas.”⁶¹

Leased Farmland

The amount of Burlington County’s total farmland that was leased into operations changed little between the 1987 and 2002 censuses of agriculture. The rented share of all land in farms dropped slightly from 37.1% to 35.4% (Table 2). However, since the recorded total land in farms actually increased, there was a small growth in leased acres—by 1,064 acres to a total of 39,371.

Groups of respondents	On the whole very affordable (%)	Affordable* (%)	Not very affordable (%)	Not at all affordable (%)	Not sure or no response (%)
All operator-owners and also nonoperator-owners who reported having detailed information about how their land was farmed (<i>n</i> = 115)	7.0	17.4 (24.4)	7.0	7.0	61.8
Operators only (<i>n</i> = 95)	3.2	13.7	8.4	8.4	66.0

⁵⁸ Robert Liberty, 1998, “Oregon’s Farmland Protection Program” (paper prepared for the Performance of State Programs for Farmland Retention: A National Research Conference, Columbus, Ohio, September 10, 1998), www.farmlandinfo.org/fic/ft/ohio/liberty.html (accessed September 20, 2006); and Lawrence W. Libby and Patrick A. Stewart, 1997, *Determinants of Farmland Value* (DeKalb, IL: Center for Agriculture in the Environment, American Farmland Trust, WP-97-10), 14 pp. <http://www.aftresearch.org/research/publications/detail.php?id=64fcd6b6f55f33728fe09ea7453490b06> (accessed November 2, 2006).

⁵⁹ Interview with an attorney in the county.

⁶⁰ Carol Comegno, “Zoning a Heated Issue in Springfield Race,” *Courier-Post*, June 3, 2006, <http://www.courierpostonline.com/apps/pbcs.dll/article?AID=/20060603/NEWS01/606030380/-1/ARCHIVES> (accessed November 2, 2006).

⁶¹ Interview with a land-use attorney in the county.

		(16.9)			
Leased and operated some land in Burlington County (<i>n</i> = 23)	4.3	26.1 (30.4)	21.7	4.3	43.4
Operators reporting at least \$50,000 in gross sales 2005 (<i>n</i> = 25)	3.8	30.8 (34.6)	19.2	3.8	42.3

*The percentages in parentheses represent the sum of the two response options “On the whole very affordable” and “Affordable.”

As with our survey question about the affordability of land to *purchase* in 2005, much less than a majority found farmland rents in the county to be affordably priced. Among the 115 owners asked to answer this question, 24.4% found leased land either “on the whole very affordable” or “affordable” (Table 14). The “operators only” subgroup (95 respondents) was even less positive—with only 16.9% selecting either of those two response options. However, among the subgroup of operators with at least \$50,000 in gross sales (25 respondents), the combined percentage was 34.6%.⁶² And in the small group (23) who reported being operators of leased land in Burlington County, 30.4% considered such land to be “very affordable” or at least “affordable.” Therefore, compared to their perceptions of owned land, our respondents tended to find leased land somewhat more affordable (see tables 13 and 14)..

Our interviewed farmer leaders and other experts were also relatively more positive about the affordability of leased land versus farmland to buy:

- “The market for leasing is very competitive. Guys with \$200 per acre of gross income from soybeans are paying \$55 an acre to rent,” said an attorney.
- “You can get rental land for \$50 per acre per year. . . . 80% to 90% of the grain land in Burlington County is leased because a lot of the people with preserved land have given up farming or never did farm,” said a farmer leader.
- “Some guys can get land for free because of tax laws [i.e., if land is not farmed, the property-tax assessment can be much higher]. They farm the isolated pieces [but] have to travel far to get there,” said an agricultural educator.
- However, one informant expressed concern about bidding competition among grain farmers seeking to expand their operations: “The margin on grain is not all that great. I wonder how the producers who bid up the per-acre cost of rented land will get their profit. Vegetable guys can afford to pay more. For the most part in this county, rental ground is becoming harder and harder to find,” said an expert on agricultural finance.

Moreover, with large rental holdings, usually with short-term leases, operators may not have the incentive to keep up the land’s productivity:

- “The guys who are trying to do several thousand acres of grain farming are not able to take care of hedges, marginally able to afford lime and fertilizer.”
- “There’s a lack of long-term leases, since a lot of land is held by speculators.”
- “Most leases are for three years. Could be up to five years.”

⁶² Not surprisingly, for both affordability questions, the joint percentages of “not sure” and “no response” declined among the owners with higher gross sales.

In summary, according to our interviews and the agland owner survey, rental land was relatively more affordable in the study period of 2005–2006. Farmland for sale looked too expensive unless it was deed-restricted land or in the Pinelands Reserve Area (or both). The county government’s February 2006 auction of preserved land indicated rather strong demand for purchasing such land, but with prices bid up to levels that perhaps only specialty-crop growers are able to afford.

Section IIID: Adequacy of Non-Land Inputs for Agriculture—Credit, Labor, Manufactured Inputs and Related Services, Water, and Veterinarians for Livestock

Credit

Regarding credit for farming, relatively few of our surveyed farmers and knowledgeable nonoperator-owners (34.8% of the 115 respondents comprising these two groups) reported using that input (Table 15). Among these 40 users, a total of 62.5% said that credit was available to them “always” or “most of the time” when they needed it. If the analysis is limited to the owner-operators among these users, the combined “always” and “most of the time” percentage is virtually the same as for all respondents—62.9%. Restricting the analysis to operators with at least \$50,000 in 2005 gross sales yielded a higher level of both users—52%—and of client satisfaction with the availability of credit—79.3%.

Table 15. Surveyed Landowners’ Assessment of the Availability in 2005 of Credit: Percentage by Response Option and Group of Respondents					
Groups of respondents	Users of this type of input	Perceived availability of credit among users of credit			
		Always	Most of the time*	Some of the time	Rarely or never
All operator-owners and also nonoperator-owners who reported having detailed information about how their land was farmed (<i>n</i> = 115)	34.8	42.5	20.0 (62.5)	20.0	17.5
Operators only (<i>n</i> = 95)	36.8	42.9	20.0 (62.9)	20.0	17.1
Operators reporting at least \$50,000 in gross sales 2005 (<i>n</i> = 25)	52.0	46.2	23.1 (79.3)	15.4	15.4

*The numbers in parentheses are the sums of percentages of respondents who answered either “Always” or “Most of the time.”

Our interviewed experts found it believable that relatively few operators were using credit:

- One large grower said, “I’m self-financing.” A second reported, “I operate on a cash basis.”
- From an expert on agricultural finance, we learned that banks “are losing clients, primarily because real estate values are so high that producers can sell off a tract and pay off all their debts, or put the farm into the PDR [purchase of development rights] program and pay off their debts and still have their ability to farm the land that they own.”
- Another ag finance specialist observed, “Part-time farmers, unless they’re buying real estate, don’t need a lot of credit. They’re paying for it as they go. Get one tractor or a couple of greenhouses at a time. They have cash [from their other occupations] or get home equity loans.”

The median value of an owner-occupied home in Burlington County was estimated to be \$259,300 in 2006 (Table 1), compared to \$185,200 nation-wide. If Burlington’s owners had traded up once or twice, their equity could be quite high. On the other hand, for operators needing loans for land or other purposes, money is available from First Pioneer Farm Credit, which serves six northeastern states, has an office in South Jersey, and is “part of the national Farm Credit System founded in 1916 to promote the growth and prosperity of agriculture throughout the United States.”⁶³

- A large grower assured us, “First Pioneer will loan you the money if you generate enough revenue to pay the loan. Deed-restricted land is seen as a good investment [by bankers].”
- Another operator said, “We can get good service through the Farm Credit System.”
- A third told us, “We have the greatest Farm Credit bank.”

No commercial bank in the county seems to be a significant lender to the farm sector. For operators with credit problems, USDA’s Farm Service Administration guarantees loans that are provided by First Pioneer.

Labor

During 2005–2006, the availability of labor for farming looked much more problematic than did the credit input. Comparatively more respondents reported using it, and the users on the whole were less satisfied with its availability.

Among our 115 “operation-knowledgeable respondents” (i.e., those who either were operators or were nonoperator-owners reporting they had “detailed knowledge” about how their farmland was operated), almost three-quarters (74.8%) said that they or their operators used family labor during 2005. Significantly fewer (51.3%) used nonfamily labor; a third (33.9%) reported seasonal labor; and almost the same percentage (32.2%) used “year-round” workers (Table 16).⁶⁴ Of course, there is overlap among these categories.

Type of labor	Did use this type (%)	Did not use (%)	No answer (%)
Family labor	74.8	20.9	4.3
Nonfamily labor	51.3	44.3	4.3
Seasonal labor	33.9	61.7	4.3
Year-round labor	32.2	60.0	7.8
Used at least one of these types	83.5		

*Number of respondents = 115 (those who are operators or who have “detailed information” about how their farmland in Burlington County was operated).

⁶³ First Pioneer Farm Credit, *Who We Are*, <http://www.firstpioneer.com/about/who.htm> (accessed October 28, 2006).

⁶⁴ Although this sample is relatively small ($n = 115$), the difference between the percentage of respondents who reported using family labor and the percentage who reported nonfamily labor is statistically significant in a one-tailed t test for difference of proportions from the same sample (at the .05 level or better). The difference between those using seasonal labor compared to respondents using year-round workers is too small to be statistically significant. Hereafter in this report, the adjective “significant” and the adverb “significantly” denote that differences being discussed are statistically significant, that is, greater than chance factors could explain in no more than 1 out of 10 similar cases.

However, a total of 83.5% reported at least one type (Table 16). Significantly, *almost half* of the 115 (47.8%) were unsatisfied with their labor supply in the sense that, for at least one (or the only) category used, they could obtain what they needed in 2005 just “some of the time” or “rarely or never.”

Tables 17 through 20 show *rates of usage* and *degrees of satisfaction* with the supply for each of the four types of labor, broken down by four kinds of respondents:

- All 115 operation-knowledgeable respondents,
- The 25 respondents who farm relatively substantial operations—with at least \$50,000 in gross sales for 2005,
- 49 respondents with some direct marketing of products raised on their land, and
- 44 respondents reporting at least some vegetable, fruit, or landscaping-type crops (including flowers) on their land, that is, crops that tend to be labor-intensive.

With these measures, we make comparisons of two types:

- between usage of, and satisfaction with, different kinds of labor, such as the percentage of all respondents reporting having family labor versus those having nonfamily workers, and
- between each group of respondents and its counterpart, such as the percentage of surveyed owners with \$50,000 or more in sales who report satisfaction with their labor supply versus that of surveyed owners with less than \$50,000 in receipts.

Family Labor: Not surprisingly, family labor was more frequently used than nonfamily workers. While almost three-quarters (74.8%) of all respondents to these labor questions reported having family members work in the farm operation (Table 17), the corresponding measure for that group of respondents regarding nonfamily workers is 51.3% (Table 18). The 23.5% percentage-point difference is significant.⁶⁵

In comparisons involving only the usage of family labor, 88.6% of owners with one or more of the three labor-intensive crops (vegetables, fruit, and landscaping) reported such workers, while among the respondents not having any such crops, the measure was 67.6%.⁶⁶ This 21 percentage-point difference is statistically significant.⁶⁷ Operations growing labor-intensive crops may tend to be too complex to be run entirely without family labor. We looked for significant differences based on size of operation (in gross sales) and the presence or absence of direct marketing, but found none.

Adequacy of Supply: Somewhat more than a third (37.2%) of the users of family labor reported that their needs were met “always” (Table 17). Another 29.1% chose the satisfaction level “most of the time.” To facilitate comparisons (such as to responses about nonfamily labor), we combined the percentages of “always” and “most of the time” answers and placed them in parentheses in Tables 17 through 20. This measure for all users was 66.3%. None of the three

⁶⁵ In a one-tailed test of difference of proportions (at the .1 level) in responses from members of the same sample.

⁶⁶ To avoid excessively cluttered tables, we omit from the percentages found for the comparison groups, like the 67.6% value given here for respondents without those three kinds of labor-intensive crops on their land.

⁶⁷ In a one-tailed test of difference of proportions (at the .1 level) between two independent samples.

subgroups of special interest—the larger growers, the owners with direct marketing, and those with three types of often labor-intensive crops—reported significantly more satisfaction than did their counterparts (e.g., growers with less than \$50,000 in sales, those without any direct sales, etc.).

Groups of respondents	Used this type of labor (%)	Perceived availability of family labor among users of family labor				N
		Always (%)	Most of the time* (%)	Some of the time (%)	Rarely or never (%)	
All operator-owners and also nonoperator-owners who reported having detailed information about how their land was farmed (<i>n</i> = 115)	74.8	37.2	29.1 (66.3)	25.6	8.1	86
Operators reporting at least \$50,000 in gross sales 2005 (<i>n</i> = 25)	76.9	25.0	30.0 (55.0)	35.0	10.0	20
Respondents reporting at least some direct marketing (<i>n</i> = 49)	83.7	34.1	31.7 (65.8)	24.4	9.8	41
Respondents reporting at least some land in a vegetable, fruit, or landscaping crop (<i>n</i> = 44)	88.6	25.6	38.5 (64.1)	25.6	10.3	39

*The percentages in parentheses represent the sum of the values for “always” and “most of the time.”

Groups of respondents	Used this type of labor (%)	Perceived availability of nonfamily labor among users of nonfamily labor				N
		Always (%)	Most of the time* (%)	Some of the time (%)	Rarely or never (%)	
All operator-owners and also nonoperator-owners who reported having detailed information about how their land was farmed (<i>n</i> = 115)	51.3	10.2	30.5 (40.7)	40.7	18.6	59
Operators reporting at least \$50,000 in gross sales 2005 (<i>n</i> = 25)	65.4	17.6	52.9 (70.5)	23.5	5.9	17
Respondents reporting at least some direct marketing (<i>n</i> = 49)	65.3	9.4	37.5 (46.9)	34.4	18.8	32
Respondents reporting at least some land in a vegetable, fruit, or landscaping crop (<i>n</i> = 44)	68.2	13.3	36.7 (50.0)	40.0	10.0	30

*The percentages in parentheses represent the sum of the values for “Always” and “Most of the time.”

Nonfamily Labor: In contrast, when we analyzed the responses of the same three subgroups regarding *usage* of nonfamily labor, the members of two of these subgroups were significantly more likely to report nonfamily workers than did counterparts. While 68.2% of the respondents

with one or more of the three types of crops tending to be labor-intensive (vegetables, fruits, and landscaping) employed nonfamily labor in 2005 (Table 18), only 41.2% did so among respondents with none of those crops raised on their land. The corresponding difference for surveyed owners with at least some direct marketing of their land's products compared to owners without it was 65.3% versus 40.0%.

The reported *levels of satisfaction* with the supply of nonfamily labor were mostly below those for family labor. For example, 40.7% of all users of nonfamily labor reported meeting their needs “always” or “most of the time,” compared to 66.3% for the respondents using family workers (see Tables 17 and 18).

The respondents with at least \$50,000 in gross sales were significantly more likely to be satisfied with their supply of nonfamily labor—70.5% versus 20.6% among surveyed owners with less than that level of sales. Perhaps the bigger operators can offer higher wages and/or benefits and therefore attract better quantity and/or quality of nonfamily workers. The same kind of relationship was found among respondents with one or more of the three typically labor-intensive crops; they were significantly more pleased than their counterparts not reporting such crops. The difference is 50.0% versus 28.6%.

Seasonal Labor: Only a third (33.9%) of our 115 respondents to these input questions reported using seasonal labor (Table 19). However, usage was significantly higher among owners with one or more of the three types of crops tending to be labor-intensive than among their counterparts, that is, surveyed owners with none of these crops—56.8% versus 30%.

The reported *levels of satisfaction* with the supply of seasonal labor varied relatively little across our four subgroups of respondents. However, operators with at least \$50,000 in gross sales were significantly *more* likely to be satisfied with their supply of seasonal labor than were operators with lower sales—58.4% versus 27.8%. Perhaps greater financial resources made the difference. Another possibility is that the larger farms are preferred by seasonal labor because they are more likely to offer employment year after year with predictably satisfactory working conditions.

Year-round Labor: Among all 115 of the operation-knowledgeable respondents, the percentage who reported *using* year-round labor was very close to the measure for seasonal labor—32.2% compared to 33.9%, respectively (Tables 20 and 19). Respondents with at least \$50,000 in gross sales were much *more* likely to report having year-round labor than were their counterparts with lower sales. This significant difference is 57.7% compared to 21.7%.

Satisfaction levels varied only slightly across the four groups of respondents (Table 20). However, when we looked for significant differences between any of our subgroups of special interest and their counterparts, the respondents with one or more of the likely labor-intensive crops were much more likely to be satisfied with the availability of year-round labor—75% versus 45% among users who did not report one of those types of crops. The former tended to be more pleased also with the supply of nonfamily labor (see above).

Table 19. Surveyed Landowners' Assessment of the Availability in 2005 of Seasonal Labor: Percentage by Response Option and Group of Respondents						
Groups of respondents	Used this type of labor (%)	Perceived availability of seasonal labor among users of seasonal labor				N
		Always (%)	Most of the time* (%)	Some of the time (%)	Rarely or never (%)	
All operator-owners and also nonoperator-owners who reported having detailed information about how their land was farmed (<i>n</i> = 115)	33.9	17.9	28.2 (46.1)	31.8	15.9	39
Operators reporting at least \$50,000 in gross sales 2005 (<i>n</i> = 25)	46.2	16.7	41.7 (58.4)	41.7	0.0	12
Respondents reporting at least some direct marketing (<i>n</i> = 49)	40.8	15.0	40.0 (55.0)	30.0	15.0	20
Respondents reporting at least some land in a vegetable, fruit, or landscaping crop (<i>n</i> = 44)	56.8	24.0	28.0 (52.0)	36.0	12.0	25

*The percentages in parentheses represent the sum of the values for "Always" and "Most of the time."

Table 20. Surveyed Landowners' Assessment of the Availability in 2005 of Year-round Labor: Percentage by Response Option and Group of Respondents						
Groups of respondents	Used this type of labor (%)	Perceived availability of year-round labor among users of year-round labor				N
		Always (%)	Most of the time* (%)	Some of the time (%)	Rarely or never (%)	
All operator-owners and also nonoperator-owners who reported having detailed information about how their land was farmed (<i>n</i> = 115)	32.2	16.2	43.2 (59.4)	27.0	13.5	37
Operators reporting at least \$50,000 in gross sales 2005 (<i>n</i> = 25)	57.7	13.3	60 (73.3)	26.0	0.0	15
Respondents reporting at least some direct marketing (<i>n</i> = 49)	28.6	7.1	57.1 (64.2)	28.6	7.1	14
Respondents reporting at least some land in a vegetable, fruit, or landscaping crop (<i>n</i> = 44)	36.4	25.0	50.0 (75.0)	18.8	6.3	16

*The percentages in parentheses represent the sum of the values for "Always" and "Most of the time."

Findings from Interviews with Local Agricultural Leaders and Experts

To what extent does the information gained from our interviews support or elucidate the survey findings?

As discussed above, the surveyed operators with less than \$50,000 in gross sales reported more difficulty in securing needed nonfamily and seasonal labor. We interviewed only two relatively small operators:

- “The biggest problem I’m facing at the moment is labor [for maintaining the stable]. I need two workers to do the heavy manual labor. I have none. Nobody wants to work that hard—manual labor. And what they want for it, you can’t afford. I don’t speak Spanish, so I can’t get immigrant labor.”
- “Kids no longer work for an operation like mine. I don’t use outside labor; I depend on volunteers from among my clients [whose horses are boarded there]. This lack of labor keeps me from expanding.”

Among eight large operators with whom we talked, the labor supply picture looked somewhat better. Two were grain farmers who could substitute machinery for labor to the point that they needed very few workers:

- “Just me, my wife, and one fellow. I used to have a list of kids for part-time work, but can’t get them.”
- “Most grain farmers can do the work with a son or other relative. My son works with his son,” said a semi-retired grain farmer.

Fruit, vegetable, and landscaping farms have tasks that require handwork, such as pruning trees, cutting flowers, picking produce, and packing it. Then, if they market directly, they need staff for selling at farmers’ markets or on-farm stands, supervising u-pick enterprises, and so forth. One interviewee reported 36 workers; another, 60; and a third had as many as 100 (at least at one point during the crop year). Both Mexicans and local people were hired. However, local workers seemed a less reliable source:

- “Most vegetable farmers use Mexican labor. I had 80 apple trees, but because of a health problem, I could not prune them. A neighbor sent over a team of his Mexican workers.”
- “Kids don’t want to work. And state laws are onerous regarding conditions of their employment. It’s almost a full-time job to work with the laws regarding their ages and what they can do per age.”
- “Part-time migrants do orchard pruning. Mexicans pick blueberries. High school kids won’t do that kind of work all day, and that’s what we need done.”

However, at certain times—like harvesting or October’s agritourism events—when large numbers are indispensable, big growers may have sufficient money to attract local workers (or else not be able to survive in business):

- “In October we have a lot of staff, all local people: mostly kids, retired guys. How do we get them? The minimum wage is \$6.15, and goes to \$7.15 in October.”
- “We supplement our own labor force with local semi-professionals like policemen who like to come here to hunt. They are willing to help us. We pay them quite adequately.”

Four of the five interviewed larger farmers who used Mexican labor were both pleased with them and explained how they attracted and kept good workers:

- “We pay them the minimum wage. We have beds for them but do not charge. Electricity and heating fuel are also supplied.”
- When I started in the business in 19—, there was a transition from Puerto Rican to Mexican workers. I started with two Mexican workers—excellent people, one of whom is still with me. . . . I have a very stable crew because they like their jobs; they get paid at a higher rate than most other farm jobs. I treat them as people. I know their names; I

love them. One fellow tells his nephew or brother, so that a lot of my men are relatives because they know that it's a good place to work and that I treat my men well. I don't have any shortage, although elsewhere in the state there have been shortages."

- "You get enough good ones returning if you treat them well. We had a washing machine for them that continued to break down, so I bought a new one."
- Another farmer had recently built a \$300,000 housing facility for three dozen migrant workers.

When interviewed during the summer of 2006, these operators and a state-level expert on migrant labor agreed that the federal government had been largely cooperative in administering immigrant laws. The farmers' financial records were regularly inspected to determine if they had paid at least the minimum wage, withheld and submitted the appropriate taxes, and filled out the required I-9 form.⁶⁸ However, they had not been asked by government to authenticate the documents.

- "The applicants need proper IDs, which means a green card with their picture on it and a Social Security card. They fill out the I-9 and W-4, and they give them back to me. Then we're set. But six months later, after we have been paying withholding taxes on them, the INS [Immigration and Naturalization Service] will inform us that the Social Security number is invalid. [Then what do you do?] Nothing. These guys are paying withholding, and that's the end of the story."
- "If a new worker comes into the office and presents to me credentials that are on the list of acceptable credentials [Social Security card, US passport, a state-issued ID] and they appear to be valid, I can employ him. . . . [T]he law says that I don't have to look into that beyond the obvious appearance of the credentials looking invalid."
- "The farmer is required to submit an I-9 form. He is not required to verify the validity of the documents he is given. If it is not valid, they receive a letter from Social Security about a mismatch, and it needs to be corrected. Social Security does not have enforcement powers. The IRS [Internal Revenue Service] can levy a 50-dollar fine for each mismatch, but I don't know anyone who's been fined. Right now everyone looks the other way because they know the situation. [Can the grower hire the same worker next year?] Technically, no. But practically can and do."
- "He comes back the next year with a different green card and Social Security number."

One of interviewed growers had stopped employing Mexican labor because he ceased to grow a particular crop. It had required many workers for a relatively brief harvest time, but the supply had become too uncertain for that grower to risk continuing the crop. Part of the problem may have been competition from other sectors of the local economy:

- "The landscapers will pay three to four dollars an hour more than farmers can afford," said an agricultural educator.

⁶⁸ "All U.S. employers are responsible for completion and retention of Form I-9 for each individual they hire for employment in the United States. This includes citizens and noncitizens. On the form, the employer must verify the employment eligibility and identity documents presented by the employee and record the document information on the Form I-9. Acceptable documents are listed on the back of the form, and detailed below under 'Special Instructions,'" US Citizenship and Immigration Services, <http://www.uscis.gov/graphics/formsfee/forms/i-9.htm> (accessed October 29, 2006).

- “There is competition with fast food chains. There’s been a large increase in the Hispanic population in a lot of the farm areas. Buy they are moving to fast food chains, getting in out of the weather and earning more money and some benefits,” said an expert on agricultural finance.

Manufactured Inputs and Related Services for Burlington County Farms: Agricultural Chemicals, Seeds, Implements, and Equipment

Two-thirds of the 115 operation-knowledgeable respondents reported that *farm chemicals* were used on their land in Burlington County during 2005 (Table 21). That usage level did not change when we narrowed the analysis to “operators only.” However, among the surveyed operators with at least \$50,000 in sales, the recorded usage rate was significantly higher—96.2% versus 56.7% among farmers with less than that level of gross sales.

Table 21. Surveyed Landowners’ Assessment of the Availability in 2005 of Farm Chemicals: Percentage by Response Option and Group of Respondents						
Groups of respondents	Used these types of input (%)	Perceived availability of farm chemicals among users of farm chemicals				N
		Always (%)	Most of the time* (%)	Some of the time (%)	Rarely or never (%)	
All operator-owners and also nonoperator-owners who reported having detailed information about how their land was farmed (<i>n</i> = 115)	67.0	53.2	29.9 (83.1)	11.7	5.2	77
Operators only (<i>n</i> = 95)	66.3	52.4	30.2 (82.6)	12.7	4.8	63
Operators reporting at least \$50,000 in gross sales 2005 (<i>n</i> = 25)	96.2	52.0	32.0 (84.0)	16.0	0.0	25

*The percentages in parentheses represent the sum of the values for “always” and “most of the time.”

Among the three groups of respondents in Table 21, the reported satisfaction level varied little. In all groups, more than half the members indicated that farm chemicals were “always” available when needed, and more than 80% chose either the “always” or “most of the time” response options. The operators reporting at least \$50,000 in gross sales were no more satisfied than their counterparts with lower sales. In other words, greater financial resources do not seem to have leveraged better service.

Regarding *seed supplies*, the reported usage level was a little higher—71.3% among all 115 owners who were asked these questions, compared to 67% for agricultural chemicals (Tables 20 and 21).⁶⁹ The 95 “operators only,” as well as the 25 with at least \$50,000 in sales, had virtually the same usage levels as did the main subsample of 115 owners (Table 22).

The satisfaction level among the main subsample was 74.3% reporting their seed supplies being available either “always” or “most of the time.” This measure is somewhat lower than for

⁶⁹ This difference is not statistically significant in a one-tailed *t* test of difference of proportions from the same sample.

chemicals (83.1%) but not significantly so. Neither were the operators with high sales significantly more satisfied than those reporting less than \$50,000. In other words, greater receipts did not seem to command better service.

Groups of respondents	Used these types of inputs (%)	Perceived availability of seed suppliers' goods and services among users				N
		Always (%)	Most of the time* (%)	Some of the time (%)	Rarely or never (%)	
All operator-owners and also nonoperator-owners who reported having detailed information about how their land was farmed (n = 115)	71.3	46.3	28.0 (74.3)	19.5	6.1	82
Operators only (n = 95)	72.3	45.6	27.9 (73.5)	20.6	5.9	68
Operators reporting at least \$50,000 in gross sales 2005 (n = 25)	71.6	52.6	31.6 (84.2)	5.3	10.5	19

*The percentages in parentheses represent the sum of the values for "Always" and "Most of the time."

Among the members of our main subsample (115), 80.9% reported using goods and services from *implement dealers* during 2005 (Table 23). Across the three kinds of manufactured inputs we have been discussing, this usage level is the highest (Tables 21 through 23).⁷⁰ Among "operators only," it was 85.3%, and for the subsample of farmers with at least \$50,000 in gross sales, the level was even higher—at 92.3%. Their counterpart operators with less than \$50,000 were not as likely to patronize dealers that year—85% of them did, but not significantly less. Their satisfaction level was also lower—70.6% compared to 83.3% among users with the higher sales levels, but not greater than chance factors alone can explain.

Groups of respondents	Used these types of input (%)	Perceived availability of goods and services from implement dealers among users				N
		Always (%)	Most of the time* (%)	Some of the time (%)	Rarely or never (%)	
All operator-owners and also nonoperator-owners who reported having detailed information about how their land was farmed (n = 115)	80.9	43.0	31.2 (74.2)	22.6	3.2	93
Operators only (n = 95)	85.3	42.0	32.1 (74.1)	23.5	2.5	81
Operators reporting at least \$50,000 in gross sales 2005 (n = 25)	92.3	45.8	37.5 (83.3)	12.5	4.2	24

*The percentages in parentheses represent the sum of the values for "Always" and "Most of the time."

⁷⁰ However, none of these differences is greater than chance factors alone can explain.

Findings from Interviews about Manufactured Inputs and Related Services for Burlington County Farms

As just discussed, from about three-quarters to over 80% of the operation-knowledgeable respondents reported that the supplies of chemicals, seeds, implements, and related services were available to them when needed “always” or “most of the time” (Tables 21 through 23). Our interviews with farm leaders and other persons well informed about Burlington County agriculture largely confirmed those assessments.

Regarding *chemicals and seeds*, we found both wholly positive evaluations and two statements indicating a need to adapt to reductions in the local supply services:

- “We’re okay with chemicals and fertilizers,” said an agricultural educator.
- “No problem with seeds,” said an operator.
- “We can get the chemicals we need, no problems,” said a second operator.
- “Chemical dealers—fertilizer and pesticides—deliver to our farm. We used to have to collect the material in our own cart. Now they drop it off, and our cart stays here,” said a third operator.
- “You can get them [chemicals], [but you] don’t have a lot of choices; better to pre-plan their use and order them. If the big suppliers don’t have them, you may have a problem. There are two suppliers. One is local. . . . The next alternative is two counties away. They’ll deliver, but not the next morning,” said a fourth farmer.
- “For seeds you need to plan what you need; [you] can’t skip over to Agway to get an extra 10 bags. Work with your neighbor. If he has some extra bags, you can get them right away. If you don’t figure right, and the rain is coming [and you need to plant right away], it’s better to get neighbors to help you out. But the neighbors are getting farther apart,” said a fifth operator.

At least two local chemical suppliers provide on-farm services, such as custom mixing and field applications. The manager of one of these companies told us that to stay in business, he needs to serve clients far into the south end of the state and also to cultivate nonagricultural customers such as landscapers and golf course managers.

Rutgers University is still providing technical assistance at the field level:

“We get the chemicals we need, no problems. We don’t rely on chemical dealers to customize products for our needs. We have to stay on top of that ourselves. My brother and I are both certified applicators. . . . Rutgers is still a tremendous support system. If we have a problem, we have a PhD here in a day. We don’t have to pay for him,” said one of the operators cited just above.

Regarding *implements, equipment, and servicing of them*, the picture was more problematic, but farmers seemed to have adjusted thanks to long-distance deliveries by truck, the work of local self-employed mechanics, and farmers’ willingness to learn how to do their own repairs or arrange for individual staff members to do it:

- “There is not a single implement dealer in the county. But no problem because one John Deere dealer [from outside the county] delivers on Tuesday, and the second one on Wednesday. And we have UPS overnight delivery,” said an operator.

- “Right now we get what we need. We get some supplies, including machinery parts, from 100 miles away—via UPS,” said a second operator.
- “When I started in 19— there were 15 to 30 dealers of every kind of equipment. Now [there are] two. I do most of my business in Pennsylvania, although there are dealers in South Jersey, 70 to 100 miles from here,” said a third operator.
- A fourth operator relied on deliveries and had no problems with them but added, “We used to go to the dealership in town as if it were the grocery store.”
- “A John Deere dealer delivers overnight by UPS if you need it. They’re an hour and 10 minutes away, two counties south. They used to be 30 minutes away,” said a fifth farmer.

Although the distant dealers may be good at arranging timely deliveries, they are not able to service machinery and equipment unless it is trucked to their locations:

- “There’s nothing better than having your local guy. We are fortunate to have two independent mechanics that we can get quickly, especially for [hay] balers. I couldn’t be in business in hay without them. You can’t wait two hours if the baler is down,” said an operator.
- “I have a mechanic who comes on weekends and after hours to work on my many tractors and vehicles,” said a second operator.
- “I have a semi-retired friend who can do a lot of repair work,” said a third farmer.
- “We handle most of it in town. If it can wait until January, we love to spend the winter doing that kind of thing. We don’t have a 30-dollar-an-hour mechanic on staff, but my brother, dad, and I are pretty handy with a wrench. Three of the guys working for us can do oil changes, fix something that’s broke, or change a tire. We have a very nice shop,” said a fourth operator.
- “A local person does the diesel engines. Another local guy helps when our boys are too busy to handle everything. A young guy works on the side to help a few hours a week,” said a member of a family agricultural business.

Veterinarians for Livestock

As Table 3 reports, the Burlington County livestock sector still generated substantial revenue in 2002—\$10.4 million. Although the once important dairy sector had declined, equine operations had grown from an estimated \$950,000 in 1987 to over \$4 million in 2002 (Table 3). Therefore, we asked the surveyed farmers about the availability of the “services of a large-animal veterinarian . . . when needed.” Four in 10 (40.9%) of our 115 operation-knowledgeable respondents reported that a veterinarian’s service was used on their land, and 57.4% of them said it was available to them “always” when needed; and another 21.3% chose “most of the time,” for a combined 78.4% level of satisfaction (Table 24). In the group of 49 surveyed owners who indicated that they raised at least some hogs, pigs, dairy cattle, beef cattle, horses, and/or sheep on their land, the corresponding measure was 82.1%.

Table 24. Surveyed Landowners' Assessment of the Availability in 2005 of Services of a Large-Animal Veterinarian: Percentage by Response Option and Group of Respondents						
Groups of respondents	Used this type of input (%)	Perceived availability of services of large-animal veterinarian among users				N
		Always (%)	Most of the time* (%)	Some of the time (%)	Rarely or never (%)	
All operator-owners and also nonoperator-owners who reported having detailed information about how their land was farmed (<i>n</i> = 115)	40.9	57.4	21.3 (78.4)	12.8	8.5	47
Respondents reporting that hogs, dairy cattle, beef cattle, horses, and/or sheep were raised on their land (<i>n</i> = 49)	79.6	59.0	23.1 (82.1)	10.3	7.7	39

*The percentages in parentheses represent the sum of the values for “Always” and “Most of the time.”

Although these survey data indicate that most respondents with large animals were relatively satisfied with the supply of veterinary services, two interviews indicated problems for small equine operations:

- “Sometimes it’s difficult to get one [a veterinarian]. Closest is 30 miles away. Only a few in the area. If you’re not one of their regular clients, and your vet is busy, there may be trouble. We had an emergency [and] called a vet who said he was already on a call and [was] too tired. I am hoping to see a system with one vet on duty at all times,” said an owner of a 21-horse operation.
- A state-level specialist on New Jersey’s equine industry reported, “Breeders don’t have trouble getting vets, but owners of small boarding operations do. The racetrack vet would charge \$100 just to walk on to the farm to do an inoculation.”

Water for Livestock and Irrigation

Almost six in 10 (59.1%) of our subsample of 115 operation-knowledgeable respondents indicated that water was used for either livestock or irrigation on their land (Table 25). Nearly 80% of those users reported that this input was available when needed either “always” or “most of the time.” The subgroup among them with animals being raised on their land had an even higher satisfaction level—90%.

We looked for variation in satisfaction by type of crop or livestock, but with the small numbers per subgroup found none that was significant except for the difference between owners with livestock and those with fruit production. The latter stand out with their lowest percentage of “always available” answers (23.1%) and highest percentage of “some of the time” answers (Table 24). Even among the four crop groups (vegetables, fruits, landscaping products, and grains), the fruit growers had the least positive assessments. But with this apparent exception, users of irrigation water seemed largely satisfied. Almost eight in 10 of them (79.4%) reported obtaining in 2005 the water they needed either “always” or “most of the time” (Table 25).

Table 25. Surveyed Landowners' Assessment of the Availability in 2005 of Water for Livestock or Crop Irrigation: Percentage by Response Option and Group of Respondents

Groups of respondents	Used this type of input (%)	Perceived availability of water among users of water for these purposes				N
		Always (%)	Most of the time* (%)	Some of the time (%)	Rarely or never (%)	
All operator-owners and also nonoperator-owners who reported having detailed information about how their land was farmed (n = 115)	59.1	51.5	27.9 (79.4)	17.6	2.9	68
Respondents reporting that livestock of some type was raised on their land (n = 49)	81.6	67.5	22.5 (90.0)	10.0	1.6	40
Respondents reporting at least some vegetable production (n = 18)	66.7	41.7	41.7 (83.4)	16.7	0.0	12
Respondents reporting at least some fruit production (n = 20)	65.0	23.1	38.5 (61.5)	38.5	0.0	13
Respondents reporting at least some landscaping crop (n = 13)	92.3	50.0	33.3 (83.3)	16.7	0.0	12
Respondents reporting at least some of their land producing grains (n = 36)	41.7	33.3	53.3 (86.6)	6.7	6.7	15

*The percentages in parentheses represent the sum of the values for “always” and “most of the time.”

On the other hand, several of the interviewed experts in Burlington County showed concern that the increasing competition between urban and farm users of groundwater may become a threat to agriculture’s viability. While the county’s population grew by 14.1% between 1990 and 2006 (Table 1), the total number of irrigated acres increased by 47.4%, to 13,548 acres between the 1987 and 2002 censuses of agriculture (Table 2). Although in the latter year irrigation affected a still a small fraction of the total land in farms, 12.2%, the types of crops with expanding acres and rather positive assessments for the future—vegetables, fruits, and landscaping products—tend to require irrigation (Table 25).

- One fruit farmer told us: “We are concerned about the supply of water for agriculture because we have a shallow aquifer. . . . [Urban users might cause] it to be over-pumped and depress the water table in surrounding [agricultural] areas.”
- Another farmer was worried that his son would move his operation out of state in search for more reliable sources of water.
- A knowledgeable observer of water issues in Burlington County reported, “In northern New Jersey, farmers are deprived of water they need because residential users claim it. I think that it will come to a head here.”

Water use in New Jersey is regulated by the state’s Department of Environmental Protection (DEP). According to the Heinrich and Schilling study, DEP requires that farmers “with the capability to withdraw ground water or pump surface water from streams or ponds in excess of . .

. [100,000 gallons per day] must obtain an Agricultural Water Usage Registration.”⁷¹ Those two researchers found that 198 Burlington County farmers were registered. If they exceeded the 100,000-gallon standard, another step is required—obtaining an Agricultural Water Usage Certification. For at least one of our interviewed Burlington County farmers, this second process did not guarantee one’s water allocation: “We have two wells. . . . Government requires that every year we fill out a water user report to the DEP. Every five years we have wells recertified for our allocation. They have cut our allocation back a little bit.”

The Burlington County government is trying to protect existing allocations and to provide for the needs of growers wishing to expand production of crops requiring irrigation. Following the state’s enactment of authorizing legislation, the county designated in 2004 an agriculturally important multi-township area in the northwestern part of the county as a “receiving area,” where farmers may qualify for higher usage amounts.⁷² Outside that area, farmers should not be able to increase their withdrawals: “The allocation formula in this receiving area is 40% for residential, 50% for agriculture, and 10% leeway,” reported a local expert on groundwater issues.

Section III E: Conflicts with Nonfarmer Neighbors

Virtually every urban-edge agricultural area has experienced conflicts between farmers or ranchers on the one hand and their often increasing numbers of nonfarm neighbors on the other. The latter complain about agriculturally caused odors, dust, chemical drift, noises (especially early morning or late at night), and other perceived nuisances.⁷³ Their complaints may translate into lawsuits or hostile-to-farmers actions by local governments that are influenced by the growing numbers of nonfarmer voters.

Our survey of agricultural landowners contained three questions about such conflicts:

- “Q4. In the past five years (i.e., since 2001), has any nonfarm resident near your agricultural land in Burlington County *complained* about agricultural operations on land you own?”
- “Q5. In controversies between farmers and nonfarmers, do local government authorities in Burlington County tend to: side with the nonfarmers, side with the farmers, be even-handed (side with farmers sometime and nonfarmers other times), not sure?”
- “Q6. On any of the land you own in Burlington County, has the farming operation been significantly changed because nonfarmers lived nearby? No change, one or more changes for the worse, one or more changes for the better, both kinds of changes have occurred, not sure?”

⁷¹ Heinrich and Schilling, *Agriculture in Route 206 Farm Belt*, p. 25.

⁷² Information in this paragraph comes from a person knowledgeable about water issues in the county.

⁷³ Ray Coppock and Marcia Kreith, eds., 1997, *California’s Future: Maintaining Viable Agriculture at the Urban Edge* (Davis: University of California Agricultural Issues Center), 80 pp; “Old MacDonald Had a Farm, but the Homeowner’s Association Told Him that Cows, Pigs, and Fruit Trees Were Prohibited,” *Hawaii Island Journal*, <http://www.hawaiiislandjournal.com/stories/7b03a.html> (accessed August 5, 2005); and J. Dixon Esseks and Robert B. McCallister, 1986, “Assessing the Need for Local Government Intervention in Farm-Subdivision Conflicts,” in *Rural Public Administration: Problems and Prospects*, ed. James H. Seroka (Westport, CT: Greenwood Press), pp. 137–54.

Among all 140 respondents, 20% reported at least one complaint in the past five years (Table 26). Among the 95 operators, the level was just a little higher—24.2%. However, when the analysis is limited to operators with at least \$50,000 in gross sales, the percentage rises to 48%. We used regression analysis to determine if the underlying causal factor might be the number of acres owned in Burlington County rather than gross sales alone, since the area size of the holdings could be an indicator of exposure to complaints. The more acres, perhaps, the more potential to be farming near a complainer. However, in the regression analysis, the number of those acres did not make a difference, while having at least \$50,000 in sales increased the chances of a complaint by a factor of 4.2, other causal variables held constant. Perhaps the intensity of the operation is the key factor, although such variables as owned acres in vegetables, fruit, or nursery-type crops did not prove to be significant predictors.

Group	Percentage of group reporting a complaint	Number in the group
All surveyed agricultural landowners	20.0	140
All operators	24.2	95
Operators with at least \$50,000 in gross sales in 2005	48.0	25

Among our interviewed farmers, two had neighbors who objected to the construction of living accommodations for their migrant laborers. Two equine farmers reported complaints about dust raised from horseback riding and about flies attracted to horse manure piles. Also, among the vegetable, fruit, and nursery-products farmers with whom we spoke, at least one with each type of product had been criticized for chemical sprays drifting onto neighboring residential property.

Practices to Minimize Complaints or Soften Effects of Complaints

The interviews yielded stories about growers’ practices to minimize complaints or to reduce their negative consequences. Some farmers deliberately practiced tolerance of trespassing, offered gifts, were otherwise sociable, kept neighbors informed, and/or tried to keep the potentially offending agricultural operations inconspicuous:

- “I don’t get mad if neighbors pick some flowers, fish in my pond, or hunt.”
- “We reach out to be good neighbors to them. We allow them to walk the farm with their pets and pick products at no charge.”
- “We drop off a poinsettia at Christmas, and another gift [in the summer]—a dozen ears of corn. They appreciate the effort in the hot sun to pick the corn.”
- “We certainly try to have good relations with our neighbors. . . . When they are out back and you are on the tractor, stop, hop off, and say ‘hello’ to them. A lot of times they want to know what you are up to.”
- “I have another farmer [client] who is surrounded by development, but he’s such an excellent communicator that he has had no problems. He explains what he is doing and informs them when he’ll do it and what he’ll do.”
- “A lot of the fruit and vegetable growers spray only at night. Yes, the wind is calmer then, but the main reason is to avoid complaints from neighbors because they can’t see them.”

In response to the question about whether *local government authorities sided with farmers or nonfarmers*, half of the total respondents were “unsure” or did not answer (Table 27). Just 15.7% of all surveyed owners believed that the authorities sided with nonfarmers. The corresponding percentage for operators was similar. Among the 25 farmers with at least \$50,000 in sales, it was only 4%.

Several of the respondents to the mailed questionnaire gave examples of local government promoting the interests of the nonfarmer:

- One township was faulted for not siding with farmers on the placement of new agricultural buildings (such as greenhouses). Neighbors wanted to minimize them. However, “the New Jersey Pinelands Commission was helpful with the approvals.”
- Another owner complained about township governments that were sympathetic to “mansion owners who demand a perfect world to look at from their patios.”
- A third lamented, “This farm is not allowed to be flexible with the changing environment. We are forced to sell after 200 years of farming in the township because of local (nonfarmer) control of the government.”

Table 27. Respondents' Perceptions of Government Taking Sides with Farmers or Nonfarmers during Controversy: Percentage by Response Option and Group of Respondents				
Group	Side with nonfarmers (%)	Side with farmers (%)	Be even-handed (%)	Not sure or no response (%)
All surveyed agricultural landowners (<i>n</i> = 140)	15.7	13.6	20.0	50.7
All operators (<i>n</i> = 95)	14.7	14.7	21.1	49.5
Operators with at least \$50,000 in gross sales in 2005 (<i>n</i> = 25)	4.0	20.0	36.0	40.0

Regarding the question about *whether nonfarmers living nearby had caused significant changes in the farming operation*, 18.6% of all respondents reported “one or more changes for the worse,” and another 7.9% indicated both negative and positive modification for a total of 26.5% with at least one negative change in the farm (Table 28). The corresponding combined percentage for operators was a little higher. But the subgroup of farmers with at least \$50,000 in gross sales registered a significantly greater level—40%.

Table 28. Owners' Reports on Whether Farming Operations Have Changed Because Nonfarmers Lived Nearby: Percentage by Response Option and Group of Respondents						
Group	No change (%)	One or more change for the worse (%)	For the better (%)	Both kinds occurred (%)	At least one for the worst*	Not sure or no reply (%)
All surveyed agricultural landowners (<i>n</i> = 140)	67.1	18.6	1.4	7.9	(26.5%)	5.0
All operators (<i>n</i> = 95)	66.3	22.1	0.0	7.4	(29.5%)	4.2
Operators with at least \$50K in gross sales in 2005 (<i>n</i> = 25)	56.0	28.0	0.0	12.0	(40.0%)	4.0

*The sum of the second and fourth columns of percentages from the left.

We used regression analysis to explain the *absence* of a negative change as of the time of the survey in 2006. We avoided explaining the *occurrence* of change because it might have happened many years before the conditions that the questionnaire measured for 2005 (e.g., acres owned, years in farming). Therefore, we hypothesized that respondents were more likely to report *no* “changes for the worse,” given certain types of production on their owned land and several other traits that intuition suggested might make a difference: whether a complaint had been made in the past five years, total number of owned acres (a measure of exposure to potential complainers), gross sales (another indicator of size), gross sales divided by total acres operated (a measure of intensity of the operation), and years the respondent had been farming (an indicator of experience). The measures of size and intensity did not prove to be significant predictors of the absence of negative changes. However, the operator’s years of experience did make a difference:

- The more years being a farmer, the *greater* the likelihood of *having avoided negative change* thus far in the respondent’s operation due to nonfarmer neighbors living nearby. Perhaps the more experienced the farmer, the more likely he/she could apply some of the practices—discussed earlier in this section—to minimize nuisance complaints from neighbors or the consequences of complaints.
- Another significant relationship was with the presence of vegetable production on the respondent’s owned land. Other things being equal, such production *decreased* the chances of there being *no change* for the worse. Something about that kind of enterprise (perhaps the use of chemicals, the building of greenhouses, or an on-farm retail stand) may have elicited complaints that caused change. The presence of other types of enterprises—fruit, grain, hay, wood crops—was not a significant predictor, nor was the number of acres in production of those crops or of various kinds of livestock.
- Using water for irrigation or livestock also *decreased* the chances of no change. Perhaps the occurrence or expectation of conflict over water usage caused farmers to modify their operations for the worse.
- Not surprisingly, the report of one or more neighbor complaints in the past five years *greatly decreased* the likelihood of avoiding negative modification in the operation. Other things being equal, the chances of no change were estimated to drop to 7.5% of what they would be in the *absence of a complaint*.

Public Policies to Curb Complaints or Resolve Disputes

Given the apparently significant negative effect of neighbors’ complaints on farm operations, what has government—state and local—done to minimize them in Burlington County? New Jersey’s state legislature passed in 1983 the Right to Farm Act.⁷⁴ Strengthened in 1998, this act: “affords responsible farmers protections against public and private nuisance actions and against municipal regulations that constrain farming. If a farmer satisfies the eligibility criteria in the act, he is entitled to an irrebuttable presumption that his agricultural practices or operation do not constitute a nuisance. His agricultural activities may also pre-empt local municipal regulation of those activities.”⁷⁵

⁷⁴ N.J.S.A. 4:1C-1 et seq.

⁷⁵ Marci D. Green, 2005, “Right to Farm Act Resolves Disputes in Most Densely Populated State,” *Real Estate Law* 180, no. 8.

In order to be eligible for these protections, commercial farms:

- “must be operated in conformance with federal and state laws, agricultural management practices recommended by the SADC [State Agriculture Development Committee] or site specific agricultural management practices,
- must not be a direct threat to public health and safety, and
- must be located in an area where agriculture was a permitted use under municipal zoning ordinances, or
- must have been operating as of December 31, 1997.”⁷⁶

The protected management practices are regarded as “generally accepted agricultural practices,” and they can achieve that status either through action of the SADC or be defined as appropriate for a particular local site by the County Agriculture Development Board (CADB).⁷⁷

According to our interviews with local officials and farmers, here is how the protective process tended to work in Burlington County. Let us say that a neighbor complained to the farmer or to a unit of local government. Although the formal procedures provided for such complaints being referred directly to the CADB or, in its absence, to the SADC,⁷⁸ in practice some or most complaints found their ways to the county office of Cooperative Extension or to the county government’s Division of Land Preservation. Representatives of Cooperative Extension estimated that they fielded about 50 complaints a year, while a staff person of the second office recalled three to four yearly. If either office were unable to convince the farmer to adjust his/her production methods or the complainant that the farmer’s practices were appropriate and protected, the complaint might have gone to the CADB.

An attorney knowledgeable about the work of this board observed that it could authorize a localized practice like “washing and packaging peppers grown on your farm,” and the board’s decision trumped regulations by the municipality. The “lead case” in New Jersey supporting this preemption is a 2002 ruling, *Township of Franklin v. Den Hollander*. David Den Hollander wanted to expand an already large greenhouse operation. Township government objected that “the greenhouses and fields topped with fabric and plastic for weed control are creating an impervious cover that exceeds township land use regulations.”⁷⁹ The New Jersey Supreme Court ruled that the CADB and the State Agriculture Development Committee, not the municipal government, had primary regulatory jurisdiction.⁸⁰

⁷⁶ New Jersey Department of Agriculture, *Farmland Preservation Program, Protecting the Right to Farm in New Jersey*, <http://www.nj.gov/agriculture/sadc/protectright.htm> (accessed November 25, 2006).

⁷⁷ Both the State Agriculture Development Committee and the county Ag Development Boards were authorized by the 1983 Right to Farm Act. Burlington’s board, called the “Farmland Preservation Advisory Board,” has had 12 members, half of whom were farmers in 2006.

⁷⁸ New Jersey Department of Agriculture, “Formal Conflict Resolution Process” in *Right to Farm Program: Resolving Agricultural-Related Conflicts*, <http://www.nj.gov/agriculture/sadc/rtfconflictres.htm> (accessed March 19, 2007).

⁷⁹ Jean Mansur, “Neighbors Fight Hunterdon Expansion Plan,” *Star-Ledger*, March 20, 2003, <http://www.gsenet.org/library/11gsn/2003/g030321.php#BOARD%20TO%20HEAR%20GREENHOUSE%20DISPUTE> (accessed November 25, 2006).

⁸⁰ Green, “Right to Farm Act Resolves Disputes.”

According to observers familiar with the handling of complaints in Burlington County, resolution of disputes normally occurs either before they are heard by the Burlington CADB or prior to being sent from that body for review by the state committee. In one case, for example, an agricultural leader told us, "There was not a formal ruling by the CADB. I was involved as was the CADB. We developed a consensus and sent it to the township, which seemed to accept what we wrote."

Of course, it helps when the township is sympathetic to farmers. One major grower told us that he had not asked for help from the CADB but worked directly with the neighbor and/or the municipalities. He had farms in four different municipalities and believed that the ease of settling disputes varied in part according to whether the municipal government had a right to farm ordinance and how strong it was.

Disputes that cannot be resolved locally may benefit from a voluntary mediation program operated by the SADC. Mediators specially trained to deal with these issues are available in different parts of the state. A state official told us that statewide in 2004–2005, "there were three to four mediations under right-to-farm disputes, and all but one reached successful conclusions."⁸¹

Section IV: Future Viability of Agriculture in Burlington County

Much of both our interviews with local experts and the survey questionnaire for agricultural landowners focused on the likely future of agriculture in Burlington County. We addressed five main questions or pairs of questions:

1. To what extent did the agricultural landowners plan to develop their land for some nonfarm uses in the next 10 years?
2. Did the existing farm operators among our respondents plan to stay farming in the county for the next five or 10 years?
3. Did those farmers have succession plans, and whom did they expect to succeed them as operators of the land?
4. Did they intend to invest in their Burlington County land, and to expand or contract their operations there?
5. Did they see a bright, modest, dim, or no future for agriculture in the county 20 years into the future? Did the interviewed experts have similar expectations for the future?

Plans for Development

In response to the survey question about plans to develop the farmland they own in Burlington County, 55.7% of the full sample reported no plans to develop in the next 10 years (Table 29). Only 10.7% believed that all their land would go into some nonagricultural use, and 19.3% expected something between 1% and 99% being converted. About one in seven (14.6%) were unsure or chose not to answer.

⁸¹ Interview with an officer of the State Agriculture Development Committee.

Among the operators surveyed, 60% anticipated that all their owned land would remain undeveloped for at least 10 years, and among the operators with at least \$50,000 in sales, the corresponding percentage was a little higher—68.8%

Group	None	1% to 24%	25% to 49%	50% to 75%	75% to 99%	100%	Not sure or no reply
All surveyed agricultural landowners (n = 140)	55.7	8.6	5.7	1.4	3.6	10.7	14.6
All operators (n = 95)	60.0	6.3	4.2	2.1	1.1	11.6	14.7
Operators with at least \$50,000 in gross sales in 2005 (n = 25)	68.0	8.0	4.0	0.0	0.0	12.0	8.0

When we used regression analysis to see if types of crops, profitability, or any other plausible causal factor made a difference, five variables emerged as significant predictors of at least some development of the respondent's owned land in the county. Other things being equal:

- Farmers who were “very” or at least “moderately” satisfied with the profitability of marketing outlets for their land's products were *less* likely to expect development of any of their land.
- So were respondents who raised hay on the farmland they owned in the county.
- Also less likely to anticipate any development were owners who found the leased farmland in the county to be “on the whole very affordable” or at least “affordable.”
- Less likely to develop were respondents who believed the services of large-animal veterinarians were available “when they were needed” either “always” or “most of the time.”
- However, *more* likely to expect to develop were operators who used seasonal labor. Perhaps they felt more vulnerable to supply problems with that kind of input.

Operators' Five- and 10-Year Expectations for Farming in Burlington County

All operators were asked if they expected “to be in farming in the country five [and 10] years from now.” More than three-quarters (78.9%) replied “yes” to the first time frame, but only about half (53.7%) to the 10-year horizon (Table 30). Relatively few answered “no,” while 15.8% and 33.7%, respectively, were unsure or chose not to reply. Perhaps improved conditions may persuade many of them to stay.

Group	5 years			10 Years		
	Yes (%)	No (%)	Unsure or no reply (%)	Yes (%)	No (%)	Unsure or no reply (%)
All operators (n = 95)	78.9	5.3	15.8	53.7	12.6	33.7
Operators who were less than 55 years old (n = 44)	93.2	0.0	6.8	65.9	6.8	27.3
Operators 55 or older (n = 50)	68.0	8.0	24.0	44.0	18.0	48.0

We used regression analysis to identify conditions likely to shape answers to the survey question about staying at least 10 years. Not surprisingly, age made a difference, and second and third lines of data in Table 30 illustrate that point. While 65.9% of the responding operators who were less than 55 said they would stay on for at least 10 years, only 44% did among the farmers 55 and over.⁸²

Although farmers cannot be persuaded to become younger, we found other apparently causal conditions that can be influenced by public policy. Respondents who had a son, daughter, or grandchild lined up to succeed them as operator were more likely to stay at least 10 years—probably to keep the farm going until they and their heirs were ready for the transfer. In our sample of operators, 76.9% of farmers with such successors expected to stay at least 10 years, while among the respondents without a child or grandchild to take over, the corresponding percentage was 56.6%.

How are heirs persuaded to take over the farm? Regression analysis found that, other things being equal, there was more likely to be a successor operator from the family if the surveyed farmer believed that:

- markets for his/her land goods were currently profitable,
- the prices for farmland to purchase were affordable, and
- local governments were “even-handed” in dealing with controversies between farmers and nonfarmers.

Public policy could help markets to become more profitable (e.g., promoting local farmers’ markets or zoning to permit on-farm stores), as well as persuade farmers that local governments are sympathetic when faced with complaints about normal farming operations. New Jersey seems to have a strong legal framework for helping farmers deal with such conflicts, but improvements are doubtless possible at the local level.

Succession Plans

Our agland owner survey asked also about succession plans (Table 31). Advocates of succession planning argue that it may be essential to the continuing viability of the farm operation.⁸³ For example, such plans may obviate the need to sell farmland to meet tax obligations or to pay off the heirs who are unwilling to farm or be non-operating partners or stockholders.

Among all 140 respondents, only 17.1% reported succession plans already developed, while 14.3% chose the response option “One is under consideration” (Table 31). The percentage of “yes” responses was somewhat lower among the farm operator subsample—14.7%. The 2001 Agricultural Resource Management Survey conducted by USDA’S Economic Research Service

⁸² Just over half (53.2%) of our subsample of 95 Burlington farm operators were at least 55 years old; 25.3% were 65 or more. These measures compare to the 2002 Census of Agriculture’s finding that 46.2% of all county operators were at least 55 and 19.3% reported being 65 or older.

⁸³ New Jersey State Agriculture Development Committee, Farm Link Program, *Transferring the Family Farm: What Worked, What Didn’t for Ten New Jersey Families* (Trenton, NJ), 38 pp.; Caroline Berry, 2006, *Commentary: Plan Now to Ensure the Family Farm Survives for Generation* (Sacramento: California Farm Bureau Federation), www.cfbf.com/agalert/AgAlertStory.cfm?ID=619&ck=CDC0D6E63AA8E41C89689F54970BB35F (accessed March 4, 2008).

and the National Agricultural Statistics Service asked about succession plans, finding that 27% of its sample of operators reported having them.⁸⁴

According to regression analysis of our subsample, the likelihood of a plan *increased* if a son, daughter, grandchild, or other relative was expected to farm the land when the farmer retired. The chances *decreased* if the respondent reported at least one “change for the worse” in his/her operation because “nonfarmers lived nearby.” Another statistically significant difference was the number of acres in hay or other forage crops on land the respondent owned in Burlington County. The more such acres owned by a surveyed operator, the higher the likelihood of a succession plan. Among the variables that did not make significant differences were the amount of 2005 gross sales, the percentage of household income derived from the operation, and whether the operator was full-time or part-time.

Group	Yes	One is under consideration	No	Not sure or no response
All surveyed land owners (<i>n</i> = 140)	17.1	14.3	68.6	0.0
All operators (<i>n</i> = 115)	14.7	15.8	69.5	0.0
Operators with a relative expected to take over the operation (<i>n</i> = 32)	34.4	18.8	46.9	0.0
Operators without a relative expected to take over (<i>n</i> = 63)	4.8	14.3	81.0	0.0

*A farm succession plan arranges for the transfer of ownership and management of the land to a relative or other person.

The greatest impact we found on the likelihood of a succession plan was whether a relative was expected to take over the operation when the respondent retired. Other things being equal, that expectation increased the chances of a plan having been developed by almost 20 times. However, as Table 32 shows, only one-third (33.7%) of the surveyed operators reported a relative (child, grandchild, or “other”) as their likely successor.

Response Options	Percentage	Number of cases
A son daughter, grandson, or granddaughter	30.5	29
Some other relative	3.2	3
<i>(Either a son, daughter, grandchild or other relative)</i>	<i>(33.7)</i>	<i>(32)</i>
Someone outside the family	11.6	11
Not sure	33.7	32
Other or no reply	21.0	20
Total	100.0	95

⁸⁴ Ashok K. Mishra, James D. Johnson, and Mitchell J. Morehart, 2003, *Retirement and Succession Planning of Farm Households: Results from a National Survey* (paper delivered at the National Public Policy Education Committee Salt Lake City, UT, September 21–23, 2003), 22 pp.

Expected Agricultural Investments in Farmland Owned in the County—“Over the Next Five Years”

For a number of years observers of the effects of urbanization on nearby agriculture have written about a phenomenon called “the impermanence syndrome.”⁸⁵ William Lockeretz has defined it as a set of attitudes that amount to not investing in the land’s agricultural capabilities because the “farmers see land being developed around them and consider it inevitable that their land will be developed, too. . . . Given this expectation, it does not make sense to put in long term improvements, or even to maintain existing capital facilities such as fences, buildings, irrigation equipment or drainage systems.”⁸⁶

To test for the presence of this syndrome, we asked the following question of owners who were either operators or reported having detailed knowledge about how their land was farmed:

“Over the next *five* years, will you or the farmer of your land likely make any agricultural investments of the following types on your land in Burlington County?”

- Erecting, replacing, or enlarging farm buildings.
- Building or extending farm fences.
- Installing or improving conservation or irrigation facilities.
- Other investments (Please specify).”

Over four in 10 (44.3%) of these respondents reported that they would likely erect, replace, or enlarge farm buildings during the five years (Table 33). Nearly the same percentage (42.6%) said that farm fences would be built or extended. More than one-third (36.5%) expected that conservation or irrigation facilities would be installed or improved. And 10.4% listed other types of investments such as planting perennials and building an indoor riding arena. A total of 64.3% reported at least one kind of investment. With almost two-thirds planning some improvement on their owned land, we probably should not conclude that a significant “impermanence syndrome” had set in as of the time of the survey (winter of 2006).

Type of investment	Yes (%)	No (%)	Unsure (%)	No reply** (%)
Erecting, replacing, or enlarging farm buildings	44.3	22.6	20.0	13.1
Building or extending farm fences	42.6	30.4	14.8	12.2
Installing or improving conservation or irrigation facilities	36.5	29.6	18.3	15.6
Other types of investments	10.4	20.0	15.7	53.9
At least one of the above types of investments	64.3			

*Number of respondents = 115 (those who are operators or who are nonfarmer owners who monitor operations on their land).

⁸⁵ Howard E. Conklin and William G. Leshner, 1977, “Farm-Value Assessment as a Means of Reducing Premature and Excessive Agricultural Disinvestment in Urban Fringes,” *American Journal of Agricultural Economics* 59:755–759; Rigoberto A Lopez, Adesoji O. Adelaja, and Margaret S. Andrews, 1988, “The Effects of Suburbanization on Agriculture,” *American Journal of Agricultural Economics* 70:346–358.

⁸⁶ William Lockeretz, 1989, “Secondary Effects on Midwest Agriculture on Metropolitan Development and Decreases in Farmland,” *Land Economics* 65:215–216.

**Includes respondents who did not answer these questions because they did not they expect to be farming the land five years into the future.

Expected Changes in the Farming Operations “Over the Next Five Years”

Another dimension of the health of Burlington County’s agricultural sector in the winter of 2006 was whether the surveyed owners intended to expand, contract, or not change the farming operations on their land. The absence of expansion in acres farmed, livestock raised, or numbers of separate types of crops or animals raised might suggest stagnation or worse, contraction: Therefore, we asked this question:

“Over the next *five* years, will you or the farmer of your land in Burlington County likely increase, decrease, or maintain the following aspects of the farm operation?

- Farmed acres owned in the county
- Farmed acres rented there
- Numbers of livestock raised in the county
- Number of separate crops grown there
- Number of separate kinds of livestock raised there.”

The entries in Table 34 do not show much contraction, nor do they show broad expansion. On none of the five components does the “decrease” percentage exceed 8.7%, and for the at-least-one-increase measure, the percentage is 15.7%, or about one in six of the respondents expecting some decrease. By comparison, four in 10 anticipated some increase. The highest “increase” percentages were for adding owned acres to the operation, 15.7%, and for increasing the number of separate crops grown—also 15.7%.

Combining the responses from owners expected to increasing owned and/or rented land, we get just 21.7% planning to add some land to the operation (Table 34), perhaps indicating a perceived scarcity of affordable or physically suitable land for farming. Another possibility is that owners were unsure about agriculture’s future in the county. The next topic covered is the pattern of respondents’ expectations for 20 years ahead.

Expected Viability of Agriculture in Burlington County 20 Years into the Future

The main goal of this study has been to find evidence for policy recommendations that would help to sustain agriculture in the selected counties into the next generation. We asked both the surveyed landowners and the interviewed agricultural leaders to look into the future and to predict agriculture’s status, and then we looked for reasons for those perceptions.

Landowners’ Predictions: Very few agland owners—5% of our total sample—anticipated a “bright” future 20 years down the road (Table 35). The response option “a modest future” was selected by about one-third of the respondents—34.3%. Half (50.7%) chose “dim,” although only 2.9% answered “none at all.” Among the 95 operator-owners, the distribution of responses was very similar (Table 35).

Components of farming operations	Increase (%)	Decrease (%)	Stay about same (%)	No reply** (%)
Farmed acres owned in Burlington County	15.7	3.5	67.8	13.0
Farmed acres rented there	10.4	7.0	44.3	38.3
Numbers of livestock raised in Burlington County	13.0	8.7	44.3	33.9
Number of separate crops grown there	15.7	5.2	48.7	30.4
Number of separate kinds of livestock raised there	11.3	7.0	44.3	37.4
At least one of the five above components is expected to increase	40.0			
At least one of the five components is expected to decrease		15.7		
Expect to increase the number of farmed acres that are either owned or rented	21.7			

*Owners expecting increases, decreases, or no change in five components of farming operations on their Burlington County land ($n = 115$).

**Includes respondents who did not answer these questions because they did not expect to be farming the land five years into the future.

Groups of respondents	Bright (%)	Modest (%)	Bright or modest (%)	Dim (%)	None at all (%)	Not sure or no reply (%)
All respondents ($n = 140$)	5.0	34.3	(39.3)	50.7	2.9	7.1
Operators only ($n = 95$)	6.3	29.5	(35.8)	53.7	3.2	7.4
Respondents who were "very" or "moderately" satisfied with the competitiveness of markets for their farm goods ($n = 26$)	19.2	50.0	(59.2)	26.9	3.8	0.0
Respondents who were "somewhat satisfied," "not at all satisfied," or unsure" ($n = 62$)	0.0	25.8	(25.8)	59.7	3.2	11.3

*Respondents answered the question "Thinking ahead 20 years, what kind of future do you see for agriculture in Burlington County?"

When using regression analysis to search for reasons for this pattern of predictions, we combined the "bright" and "modest" respondents to form a relatively positive group and then hypothesized various causes for their positions. We found that, other things being equal, the likelihood of being in this group

- *increased* greatly if, to the earlier question about the competitiveness of marketing outlets for their land's products, they had answered "very" or "moderately" satisfied (see the last two data lines of Table 34),
- *increased* also if respondents were satisfied with the supply of nonfamily labor, and

- *rose* if the respondent “strongly” supported the use of local government revenues to purchase development rights to productive land.
- The chances tended to *decrease* substantially when respondents believed that farming operations on their land in Burlington County had changed for the worse because “nonfarmers lived nearby.”

We included the PDR-support variable because, as discussed earlier, (a) a great deal of Burlington County’s farmland had been protected through this policy tool as of the time of the survey, (b) more was expected to be put under easements, and (c) therefore it seemed possible that enthusiasm for the program’s achievements (past and future) would correlate with, if not strengthen, a relatively positive prediction about farming in 20 years. It did. Other conditions held constant in the regression analysis, respondents who strongly supported the PDR program were three times more likely to expect at least a “modest” future.

Predictions of Agricultural Leaders about the Next 20 Years

Supply of Inputs of Production: The interviewed agribusiness managers, educators, and farmer leaders were asked about the future of agriculture in Burlington County. Here are their responses grouped by *type of production input*. Then we present their predictions about the types of farm enterprises likely to be successful into the next generation.

Land: The several interviewees who commented on the land input were rather optimistic, due mostly to the achievements of the purchase of development rights program and the preservation of farmland in the Pinelands Reserve Area. As discussed in Section IIIC above, more than 49,000 acres have been protected.

- “Half of the county is Pinelands. It’s not prime ground. The other half will remain under strong residential pressure. The preservation people there have done an excellent job. They’ll continue to be active in that area. Agriculture will remain there, with fairly large chunks of agricultural land,” said a financial expert.
- “I think that they have preserved enough farms now, so that unless there is some drastic change there will still be enough of a land base to maintain the industry,” said an agricultural educator.
- “The ones who got into it [the PDR program] will stay. And their sons or daughters are coming up to help the business continue,” said an agri-service manager.
- “[Thanks to the PDR program] many people who are involved in agriculture have figured out that it’s no longer a transitional use. . . . With more and more preserved land being available, the owner may not be a farmer, but my view is that land tenure will get better [because] someone who owns a piece of preserved land can’t decide to develop it,” said a second agri-service manager.
- Another expert was pessimistic, but he did credit the preservation program as being a possible solution: “Agriculture’s future in the county is dim because the development pressures will be too strong, unless they make additional money available for preservation purposes.”
- “Farmland preservation is going to be the key to the survival of agriculture in Burlington County,” said a second financial expert.

Future Affordability of Land: On the critical issue of the affordability of land, most farmers seeking more land may be limited to parcels that are either under easement or available for leasing.

- A specialist in agricultural land sales told us, “There is absolutely no way that a small grain or hay farmer can afford to buy land that their operations can sustain. People who produce vegetables and landscape products can buy land, most probably that is already protected.”
- In the spring of 2006, a local expert on agricultural finance estimated, “You can pay \$20,000 for non-preserved land and \$6,000 to \$8,000 for preserved land.”
- As described above, the February 2006 auction of deed-restricted parcels suggested that farmers of specialty crops could compete better than producers of grains and other commodities.
- In the search for rented land, the growers of vegetables and other higher-value crops also will likely be advantaged. “Grain farmers can afford to spend \$50 an acre, while the vegetable farmers can pay \$100 to \$125.” However, some owners of out-of-the-way parcels may feel compelled to lower their rents to zero or even offer some incentive pay, so eager are they to have the land farmed and therefore qualify for agricultural-use assessment for property-tax purposes.

Credit and Other Inputs Provided by Agri-service Businesses: Our interview sources were fairly optimistic about the availability of credit, chemicals, seeds, and spare parts for vehicles and equipment. Repair services were more problematic.

- Said an expert on agriculture finance, “We’ve made a commitment here. Our northern New Jersey office has found a way to stay in business. We have preservation down here, zoning, and Pinelands. Twenty years is a feasible time horizon.”
- From a supplier of manufactured inputs, we heard, “As long as there are farmers to supply, I can supply them for a 100 years.” He felt confident because of the complementarity of the most important component of his business—providing landscaping and nursery products—to his farm business.
- Another supplier of the farm sector had the same reason for his intention to continue to supply farmers: “More than half of our business is nonfarm. The reason that I can put more agricultural staff on is because of the strength of the commercial component of the business. They are supporting some of the agricultural business that I want to maintain.”
- Regarding spare parts, it was assumed that ordering by phone, mail, or the Internet would be used and that UPS and other express shippers would continue to deliver quickly.
- However, skilled, on-farm or near-farm repair services might be severely limited. In July 2006 there were two widely respected repairmen who served the farming community in that capacity. One was not too many years away from retirement and said that when he is gone, his clients “will have to use the dealers in Delaware and Pennsylvania—over 100 miles away. A few farmers are clever enough to do their own repairs. Newer stuff [equipment] is better, but it takes better technicians to work on it today. It’s all computerized; you need a laptop computer to work on them. I never heard of a car or truck dealership going into this business [servicing farm equipment] as a sideline.”

Water: As discussed earlier, because of competition for groundwater from nonfarm users, agriculture may not be able to increase or sustain its share.

- One influential leader told us, “We may need a water credit bank. In a lot of the county it’s a critical input.”
- In answer to the question about whether or not to “recommend that a hard-working young person with an agriculture background farm in Burlington County,” another key leader answered, “Go [farther] south in the state, because there is not enough water in Burlington County. It’s an irrigation issue; you need water. Have to be able to do the high-end crops. Without water can’t do nursery, fresh market vegetables, or such. You can’t rely on rainfall. So you need irrigation. [Alternatively] find a farm with water,” with an allocation in Burlington County that looks adequate and secure.

Labor: Another problematic input of production is labor. Ironically, the products with seemingly good market potential for some years into the future—vegetables, fruits, nursery, flowers—tend to require considerable hand labor (and water for irrigation).

- A farmer of such products told us, “Labor is a potential major problem. Some of the debate about immigrant issues is very disturbing because we can’t be here without our helpers. . . . In the worst case scenario, we’d move on; but I do not know where to go.”
- Another farmer said, “Labor is an enormous problem. We need federal legislation that provides for reasonable temporary guest workers that grandfathers workers already here. The only labor that’s worth anything is immigrant, mostly Hispanic, because they are hungry [for work].”
- Besides the problems with migrant workers’ status, an expert on ag finance told us that the trend toward legislated higher minimum wage may “price these guys [most farmers in the county] out of the market; it will certainly shrink their margins.”
- Advances in mechanization may help. One source pointed to an important improvement in sod farming. “I had a client who used to need six men to work the harvester. Now he can do it with one man, and he can pay him adequately.”

Persons Willing and Able to Farm Successfully: Opinions were mixed about the future supply of persons willing and able to farm in Burlington County. The most likely source was the existing farm family that already held considerable land. However, interviewees worried about both the will and ability of children or grandchildren to manage the kinds of farm enterprises likely to succeed in the future. To meet the career-preference and management-capability conditions for the number of farmers needed for all of Burlington County’s agricultural business opportunities will probably require some new sources—such as immigrant farmers and hired, well-paid managers of someone else’s land.

Family Members

- One expert told us that given the expensive environment in which it shall farm, the next generation of farmers should aim to get the land largely free of inheritance taxes. Good estate planning might make it possible.
- Two other interviewees cautioned that many or most heirs do not want to farm. Their negative attitude toward farming stems at least in part from their own experiences of long physical work helping with the family farm and also from their parents’ complaints about not earning enough money in return. Another factor can be the problems they witnessed that their parents had with complaining nonfarmer neighbors.

- Some of the farmers we interviewed lamented that although their children had chosen farming as a profession, they had left for other states (Maryland, Minnesota). However, several farmers told us about their promising experiences with children as potential successors. One son tried other kinds of jobs and returned to ask his dad “to teach me everything you know about the farm. And he means it. I am very lucky. . . . [But] he has a lot of maturing to do.” Another had his son manage one of the farms that was a component of the overall operation. He explained: “I think that a lot of farmers chase their kids away, whether they know it or not. Kids are not willing to wait until they are 45 or 50 years old to be in charge.” A third farmer had a son interested in the business, he had “the will to provide the opportunity” to the young man, and the family was “in the process of developing succession plans.”
- The farmer with several or many children has a greater chance of finding among them a willing, suitable successor. But then there are more total heirs to satisfy financially. According to one interviewed farmer, the solution was to try to “set aside assets for heirs in ways that kids who want to farm would inherit the land while others would have other assets.” The liquid capital realized from selling development rights can facilitate this strategy.
- Will the remaining operation be strong enough or grow sufficiently so that the next generation—the grandchildren—can farm also? One interviewed farmer was worried that the operation that his son inherited would not be able to sustain two households—his son’s and his grandson’s.
- During the time of our field research in 2005–2006, we were told that Burlington County still had considerable land to lease at affordable rates. But land for purchase tended to be too expensive for younger buyers. One expert observer told us, “Because the amount of agricultural land is decreasing, it’s difficult for young farmers to break into the ag sector. The established farmers have relationships with landowners so that they get first crack when land is up for sale.”
- The exceptions could be new farmers of specialty crops like nursery and some vegetables who, with family help or after proving themselves financially to the bank, could purchase the relatively modest amount of land needed for starting up those kinds of operations.

Future Farmers Who Are Not Heirs of Existing Farmers

- One interviewee believed that some of the future farmers in Burlington County would be Asians or representatives of other ethnic groups whose growing communities in the New York City and/or Philadelphia area provide a market for specialty crops.
- Two experts called for encouragement of manager farmers, who are hired by non-farming owners to operate farms of sufficient profitability to cover their own salaries and other costs, as well as an adequate return to the owners.
- “I’ve known children who don’t have the ability to be effective farmers. They must have the wisdom to treat their business as if they are stockholders and decide to bring in effective managers,” said one interviewed expert.
- “We are not counting on family members to work full-time to maintain the show. We have a half dozen people from outside the family who do that—full-time. One of the main reasons we are expanding is to be able to support 4, 5, or 6 families.”

Agricultural Leaders' Predictions about the Kinds of Farm Enterprises Likely to Succeed over the Next 20 Years

Grain Farms: During the spring and summer of 2006 when our interviews took place, there was considerable pessimism about the future of grain farming in Burlington County:

- “The number of grain farmers will be reduced; grain farming will become very, very difficult,” said an expert on agricultural finance.
- “There’s no doubt within the next 10 years, grain farms will dwindle. This year, a couple of the biggest farmers in Burlington County stopped growing corn because of the costs. Grain farmers are getting into other areas,” said an agri-service manager.
- “Grain farmers will go,” said another agri-service businessman.
- As input costs have risen more than market prices, grain farmers have felt compelled “to expand their base acreage. But there is competition for available land. In certain areas of the county land doesn’t stay available for more than an hour. Most of this is rental. One of the problems is the price of the land is prohibitive,” said an agricultural educator.
- “Growing corn and beans are not economically viable, and won’t be until there is a dramatic change in prices,” said an agri-service businessman.

As of the writing of this case study (2007) the increasing interest in ethanol and other market factors had improved grain prices significantly. Ideally, Burlington County farmers should have an ethanol-producing plant nearby. Local farm leaders have been trying to establish one for some years. However, net revenues per acre would have to rise very high—perhaps unrealistically so—in order for grain farming to compete with housing or even with farmers of higher-value crops bidding on deed-restricted land. Let’s say that, as discussed above, protected land is selling at \$6,000 an acre, and the Federal Land Bank’s long-term interest rate for the area has averaged 5%. If we used the farmland valuation technique of dividing the average net annual income per acre (including federal payments) by that long-term interest rate, that income would have to average \$300. If residential users were willing to pay as much as \$7,000, the corn income would need to be \$350 an acre, and so forth.

Which kinds of farm operations will out-compete residential uses in Burlington County? Perhaps few or none that is strictly production-oriented, since by the land-valuation procedure discussed above, a \$20,000 per acre sale price for non-restricted land would require net farm revenue averaging \$1,000 per year.⁸⁷ However, vegetables, fruits, nursery, and other high-value crops may do well, especially if there is direct marketing, agritainment, and/or other revenue enhancements.

Vegetables and Fruits: Our interview sources tended to be optimistic about vegetables and some fruit, especially if the products are directly marketed:

- “Producers that are involved in intensive farming operations like vegetables and nursery can hang in. Cranberries will hang in because of development restrictions on wetlands,” said an expert on agricultural finance.
- “You will see blueberries and cranberries because they are in a special environment [the Pinelands Region],” said an agri-service manager.

⁸⁷ The \$1,000-per-acre valuation was calculated using the technique in the previous paragraph.

- “There is a very strong direct market for vegetable farms. There’s a growing trend for people wanting to buy stuff from close-by sources. If fuel costs continue to go up the way they are, shipping in from the West Coast makes local production more and more viable,” said an agricultural educator.
- “We have an extremely successful orchard within 35 miles of my office that is near a fairly well-to-do town. It sells to them apples, pears, tiny blueberries and strawberry patch [berries]. It sells thousands and thousand of apple pies, none of which uses their own apples. The town approves these sales because it’s a big value-added enterprise for their town,” said another agribusiness manager.
- “Fresh sweet corn, cantaloupe, tomatoes, herbs. You need to be a marketer. . . Johnny [last name] needs his two daughters to market. . . . He gets premium prices; he’s got the right soil. He can stay above the market; he can hold the price even if the market goes down. But if you have to take it to Philadelphia [to a wholesaler], forget it,” said a farmer leader.

Nursery, Sod, and Floriculture: Farm enterprises growing landscaping products and cut flowers may also survive. They should have a transportation-cost advantage, and some may add the benefit of differentiating the quality of their products from out-of-area competitors:

- “Nursery and landscape are now profitable but driven by the construction industry, so it may not last forever,” said an agri-service manager.
- “The sod and nursery people will stay. That’s why I started up the sod part of our business,” said another agri-service manager.
- “Nursery is now the main kind of crop by money. Sod is becoming bigger in the state. . . . With sod and nursery crops, you’re not stuck with a market price as you are with corn and beans. . . . There’s a huge demand for flowers in this area, because we are surrounded by urban areas,” said a third agri-service manager.
- “Go produce, vegetables, or flowers. The most money is made from non-edibles. In this area, come Halloween time, cornstalks get a very good price for 10 stalks,” said a fourth agri-service manager.
- “The largest population centers for what I can grow my products are located here—in New York City,” said a large grower of one of these types of products.
- “Our nursery guys are starting to do branding; they differentiate their products from others. They have different hybrids of plants—proven winners. Different pots and labels about the history and how to grow it,” said an expert on agricultural finance.

Hay: This farm product from Burlington County is sold both to livestock owners, especially for horses, and to the construction industry to be spread to curb soil erosion. One farmer leader and hay producer told us, “Hay will be an excellent crop, with such a vast horse market. Smaller people don’t have the money to buy wholesale; they have to buy retail and just a pickup load.” An equine operator said that many farmers “make their money on hay and straw. . . . Long straw is shipped out to the [racing] tracks.”

Horse Breeding, Training, and Boarding: One agricultural educator told us, “Sport and recreation horsemen will always be here. We have wealthy, high-class people who think that horses are appropriate for them.”

- An operator of a horse farm was relatively optimistic about the future: “It’s pretty good because the market is growing because of increased people living here. However, “the number of horse operations has stabilized, in part because of the shut down of the Garden State track and thus lower demand for thoroughbreds,” said a second operator.
- The educator (cited just above) suggested that a racing industry may be essential to New Jersey’s equine sector: “The pleasure industry [by itself] cannot support the necessary infrastructure for equine. The racing horses make up about one-third, but they earn much more money. The horse-racing breeding and training sector support large vet clinics and the feed and equipment business.”
- Then there is the labor constraint. One of the horse farmers told us, “To be honest, what frightens me the most and makes me doubt whether I can continue is lack of labor.”

Diversified Agricultural Enterprises: During our interview research on Burlington County, both nonfarmer observers and farmers spoke admiringly of operators with diverse enterprises:

- There were the operators that market directly from their farm: “People buy and at the same time take their kids to the farm. We have thousands of people within a 40-minute car ride to our county’s farms. All the Philadelphia suburbs—the Route 1 corridor.”
- At least one operator combined crop production, repair work, and seed cleaning: “He fixes and fabricates for his fellow farmers to supplement his farm operation and keep himself on the farm. He has cows . . . and raises hay and straw for the horse market. He also cleans seeds for soybeans.”
- At least one provided varied agritainment: a petting zoo, u-pick opportunities for thousands of schoolchildren who were bused in, a summer camp, and playground and picnic areas as well as a large on-farm store.

The large diversified operations may have multiple managers, and the two or more senior positions may provide career opportunities for heirs who might otherwise claim their inheritance through forcing the sale of the operation’s land or other assets. In one case, a daughter told us that she, her siblings, her father, mother, and two aunts “each has a niche. We all work. We do what we want to do. . . .” In another case, two brothers shared management with their father: “We made a lot of mistakes. My dad had patience and let us make them. I hope that I am as gracious with my children.”

These production and marketing operations may require *special locations*. Besides being situated along, or close to, public roads with plentiful potential clients going home from work or shopping on the weekends, they probably need to be buffered from possibly complaining neighbors. In one of our on-site interviews, we found that the operation was in an area of protected farms as well as being close to the well-traveled Route 206. Another case had public roads and parkland on one side, a road and a school across the road on the second side, and large-lot residential acreages on the third and fourth. The farm owners cultivated acceptance from the residents, using some of the techniques discussed earlier in this report (Section III E).

Section V: Policy Recommendations for Keeping Agriculture Viable in Burlington County

This study’s policy recommendations focus on production inputs, property taxes, and marketing conditions, and they are put in the context of our survey and interview findings about the current and future viability of agriculture in Burlington County. The sources for the recommendations are again both the surveyed agricultural landowners and the interviewed agricultural leaders.

Maintain Programs for Protecting the Land Base

The very last survey question asked of all respondents was: “Over the next 20 years, what should interested citizens do about the viability of farming in Burlington County?” Six response options were offered, including two about protection of agricultural land. Table 36 reports the distribution of answers.

Response options	Percentage of all respondents	Number per option
Nothing; let private market forces guide things	6.4	9
Help to protect agricultural land from development (e.g., via purchase of development rights or through zoning)	33.6	46
Help farmers to farm more profitably	16.4	23
Give equal emphasis to the objectives of farmland protection and more profitable farming	26.4	37
Do something else or in addition (Please explain)	0.7	1
Not sure	5.7	8
No reply	11.4	16
Total respondents	100.0	140

A third (33.6%) of the surveyed landowners chose the option “Help to protect agricultural land from development (e.g., via purchase of development rights or through zoning),”⁸⁸ and another 26.4% selected “Give equal emphasis to the objectives of farmland protection and more profitable farming” (Table 36). Therefore, a total of 60% included land preservation in their recommendation, compared to 42.8% advocating, at least in part, assistance to enhance profitability.

Early in the survey the respondents were asked to evaluate the county’s farmland PDR program and also a proposal to limit residential development in areas of productive farmland by requiring high minimum lot sizes. The questions were:

- “Burlington County has a program that purchases the development rights to productive farmland in exchange for the owners agreeing not to develop it for nonagricultural uses. Do you support or oppose the use of local government revenues for such purchases?”

⁸⁸ The respondents selecting this policy option were probably more positive about purchase of development rights than about zoning. While—in answering other questions-- 42.6% of this group “strongly supported” using large-lot zoning to limit residential development on farmland, 63.8% of them were strong in their approval of using local government revenues to purchase development rights to farmland.

- “Some local governments across the nation have zoning policies that limit residential development on productive farmland, such as to no more than one house per 20 acres. Do you support or oppose such limits for agricultural areas of Burlington County?”

Fifty percent of the respondents “strongly” supported the existing PDR program, and another third (33.6%) chose the second-most positive option of “Support,” for a combined percentage of 83.6% in favor of the program (Table 37). By contrast, only 27.1% “strongly” supported the high minimum lot size proposal, and the combined positive percentages added to 50%. As mentioned earlier (Section IIIC), in the November 2006 election, Burlington County voters endorsed the PDR program by approving (three to one) a 30-year extension of the special real-estate tax that helps to fund it.

Response option	Existing PDR program (%)	Proposed higher minimum lot sizes (%)
Strongly support	50.0	27.1
Support	33.6	22.9
(“Strongly support” or “Support”)	(83.6)	(50.0)
Oppose	8.6	19.3
Oppose strongly	2.1	21.4
Not sure	5.7	7.9
No reply	0.0	1.4
Total respondents	140	140

*The proposal would increase the minimum lot size for new residential home sites in areas of productive agricultural land.

As also discussed previously (Section IV), several agricultural leaders said in interviews that the land protected by the PDR program has been important, if not indispensable to the survival or agriculture in Burlington County. However, with one exception they believed that more land still needed to be preserved.

Reform Farm Credit System So That Banks Like First Pioneer Can Loan to Part-Time Farmers

Our survey findings about credit availability indicated no serious problem as of the winter of 2006 (Section IIID). However, two representatives of the banking industry in Burlington County advocated a reform of the Farm Credit System (FCS)⁸⁹ that would allow the county’s major source of agricultural credit, First Pioneer Farm Credit, to lend more freely to part-time farmers, a type of operator expected to become more common:

- “Let’s say a surgeon buys a farm, but he earns more money as a surgeon than as a farmer. He becomes ineligible for certain kinds of FCS money. Or an auto mechanic who fixes

⁸⁹ “FCS provides three types of loans: (1) operating loans for the short-term financing of consumables such as feed, seed, fertilizer, or fuel; (2) installment loans for intermediate-term financing of durables such as equipment or breeding livestock; and (3) real-estate loans for long-term financing (up to 40 years) of land, buildings, and homes.” Jim Monke, 2006, *CRS Report to Congress: Farm Credit System*, 6 pp. Order Code RS21278, p. 3, <http://www.nationalaglawcenter.org/assets/crs/RS21278.pdf> (accessed December 14, 2006).

tractors and cars, with two jobs that are important to his family budget. But if the shop comes up for sale, the FCS can't help him buy that business.”⁹⁰

- “Our core farmer is going in two directions: getting larger or going to part-time. As they go part-time, our lending is limited. To part-time farmers we can lend only for agricultural purposes. For full-timers [over 50%] we can finance nonagricultural purpose. . . . [But] diversification into nonagricultural business can support the agricultural function.”

Reform Immigration Laws to Permit Migrant Labor to Serve Burlington County's Agricultural Sector

In the discussion of labor inputs in Section IIID, we discussed survey findings that indicated some real problems with the availability of workers. Almost half of the 115 owners whom we asked to evaluate the supply of that input were dissatisfied with it to the extent of reporting that at least one type of labor (family, nonfamily, seasonal, or year-round) they used was available only “some of the time” when needed or “rarely or never.” Out interviews with growers revealed significant use of migrant laborers, some or many of whom may have submitted invalid documents. At that time (the summer of 2006), the responsible government agencies were not enforcing strictly.

If, let us say, in future growing seasons, “sweeps” of larger farming operations occur like the one carried out at Swift meat-processing plants in six states on December 12, 2006, the viability of the many labor-intensive operations found in Burlington County could be severely damaged. Operators told us that they could not find enough citizens willing to work in the prevailing conditions (“stoop labor,” summer heat) and at wages that the farmers could afford. Therefore, immigration reform seems to be a critical need. As presented earlier, one expert recommended: “We need federal legislation that provides for reasonable temporary guest workers and that grandfathers workers already here.”

Encourage Training of Skilled Technicians Needed for Viable Agriculture

One expert urged support for the vocational agriculture program at Northern Burlington County Regional High School, which serves four townships in that part of the county. Accepting students also from any other township who are interested in the vocational agriculture program, this school offers courses in agricultural mechanics, plant science, and greenhouse agriculture among others.⁹¹ For example, perhaps it could graduate young persons to provide on-farm or

⁹⁰ “Full-time farmers: For individuals with over 50% of their assets and income from agriculture, FCS can lend for all agricultural, family, and non-agricultural needs (including vehicles, education, home improvements, and vacation expenses). Part-time farmers: For individuals who own farmland or produce agricultural products but earn less than 50% of their income from agriculture, FCS can lend for all agricultural and family needs. However, non-agricultural lending is limited” (Monke, *CRS Report to Congress*, p. 3).

⁹¹ “The [school's] Agriculture Program is appropriate for students interested in animals, plants or mechanics. Students interested in a well-rounded agricultural education should elect courses from all three areas. The Plant and Animal Science courses may be used to meet one year of the science graduation credit requirement. In addition, colleges accept these courses as academic units. Students can enter the agricultural world of work by selecting the Cooperative Agriculture Education course. For more information, speak with an agriculture teacher. Agriculture students are expected to participate in leadership training activities as developed through the FFA. “http://hs.nburlington.com/apps/email/send_mail.jsp (accessed December 14, 2006).

near-farm repair of machinery at critical times, rather than the farmer being compelled to take his equipment to dealers in Pennsylvania or Delaware.

Programs to Help Farming Operations to be Passed on to Successor Farmers

Only about one in six of the surveyed Burlington County agricultural landowners had “a farm succession plan that arranges for the transfer of ownership and management of the land to a relative or other person” (Section IV). Moreover, interviewed agricultural leaders were concerned that the next generation either would reject farming as a career and/or not be capable operators, or if willing and able would be forced to sell assets in order to satisfy other heirs.

Estate planning programs could help deal with the second obstacle, while the first may require hiring nonfamily managers. If the operation is profitable enough (such as through combining production with direct marketing or other business enterprises like agritainment), there would be resources both to offer a good salary and to provide adequate returns to the nonoperator-owners. The relatively nearby state university, Rutgers, can train farmers. But as one of our interviewees said, the owners must have appropriate attitudes. He urges that they see themselves as stockholders and the manager as a CEO.

Plan for Sufficient Groundwater Supplies for Agriculture

Burlington County government has a water specialist on staff who since at least 1988 has been working to help agriculture in its competition with urban users.⁹² While our survey findings indicated no serious water availability problem as of the winter of 2006, a few interviewed experts were concerned. One even recommended that young farmers go south in the state to seek more reliable water supplies (Section IV).

Monitor Administration of Right-to-Farm Laws for Ways to Strengthen Them or Their Enforcement

Only 20% of our full sample of 140 landowners reported a complaint in the previous five years “from a nonfarm resident near your agricultural land in Burlington County . . . about agricultural operations on land you own.” But the rate was 48% among operators with at least \$50,000 in gross sales (Section III E). Also, more than a quarter of the total respondents had reported at least one “change for the worse” in the farming on their land “because nonfarmers lived nearby.” Moreover, regression analysis found that such changes appear to affect at least one behavior and one attitude relevant to the continued viability of agriculture in Burlington County. As discussed in Section IV, the likelihood of a respondent reporting a farm succession plan decreased if that kind of change had occurred on his/her land. Also, the predicted probability of believing that farming in the county had a “bright” or at least “modest” future 20 years hence was substantially lower if there had been a change for the worse.

The answers to one of the survey’s questions suggest there is room for improvement in the right-to-farm protection policies operating in Burlington County. The question was:

“New Jersey has a ‘right to farm’ law designed to give legal protection to farmers when their nonfarmer neighbors complain about agricultural odors, noise or other perceived nuisances. How helpful has the law been in protecting farmers against unfair nuisance complaints?”

⁹² Heinrich and Schilling, *Agriculture in Burlington County’s Route 206 Farm Belt*, p. 26.

Only about a third of the respondents (36.4%) believed this law was “very helpful,” and another 20% considered it “moderately helpful” (Table 38). This combined percentage of 56.4% compares to almost 92.9% in support of the state’s agricultural-use basis for assessing farmland for real estate taxes (Table 38) and 83.6% of the sample giving the two most positive evaluations for Burlington County’s PDR program (Table 37).

Table 38. Landowners’ Evaluations of Right-to-Farm Law and Agricultural-Use Assessment for Property Taxes:* Percentage by Response Option		
Response option	Right-to-Farm law (%)	Agricultural-use assessment for property taxes (%)
Never heard of it	6.4	0.0
It’s not very helpful	5.7	0.0
Somewhat helpful	15.7	5.0
Moderately helpful	20.0	13.6
Very helpful	36.4	79.3
(“Moderately” or “Very helpful”)	(56.4)	(92.9)
Not sure	15.0	2.1
No reply	0.7	0.0
Total respondents	(140)	(140)

*New Jersey’s right-to-farm law protects farmers against unfair nuisance complaints. The agricultural-use assessment is a policy for moderating real estate taxes on farmland.

Our interviews uncovered only one specific recommendation to reduce conflicts between farmers and neighboring nonfarmers: to urge the schools to educate students about the realities of commercial agricultural operations and their positive contributions to the community that compensate for their dust, smells, and so forth. Four agricultural leaders made comments indicating the importance of these laws and the ongoing vulnerability of agriculture to neighbor complaints:

- “Right-to-farm is going to become increasingly important, as more and more developments spring up in the agricultural areas.”
- “Effective right-to-farm laws are third in importance in my recipe for keeping agriculture viable” (after protecting more farmland through deed restrictions and recruiting new farmers).
- “The local governments [townships and boroughs] want a pretty horse farm, a nonindustrial-appearing farm.”
- “A farm is acceptable as long as there are no noises or smells.”

From these comments we infer a need to monitor the right-to-farm laws, looking for ways to improve their content and enforcement (at state, county, and/or township level), and the public’s understanding of their purposes and workings. We understand that the New Jersey chapter of the American Planning Association is working to improve awareness of conflicts over farming and the training of professional and citizen planners to prevent or resolve them.

Explore Ways to Improve the Incentive Capacity of the State’s Agricultural Assessment Laws to Encourage Productive Farm Use of the Land

Table 38 shows that members of our sample of agricultural landowners tended to be very happy with the assessment law’s ability to keep land taxes down to “acceptable levels.”⁹³ However, is it too lenient in the amount of commercial agricultural activity required to justify the tax break?

As discussed in Section IIIC, there is concern that some or much of the deed-restricted land will eventually be purchased by nonfarmers seeking sites for estates. If they have too little incentive to lease the land to operators or to hire managers to help achieve profitable operations of their own, they may decide to limit the land’s use to the very small amount of sales required under New Jersey’s farmland assessment rules: “Gross sales of products from the land must average at least \$500 per year for the first five acres, plus an average of \$5 per acre for each acre over five.”⁹⁴ Apparently, these gross sales requirements have not been changed since the authorizing legislation was passed in 1964.

Land-Grant University Continues to Use its Research and Extension Education Capabilities to Promote Profitable Farm Operations in Burlington County

In answering the question about what concerned citizens should do (if anything) to promote the viability of Burlington County’s agricultural sector, a combined 43% recommended efforts to help farms become more profitable (Table 36). Most of the questionnaire’s suggested revenue-enhancing assistance programs (e.g., marketing directly to consumers, stores, restaurants; diversifying or adding new products) attracted support from more than 40% of the respondents (Table 12).

Two farmer leaders recommended another type of profitability assistance—applied university research:

- “The recipe for farm viability in Burlington County should include [university] research into pest control, new cultivars, and nutrition,” with special emphasis on the county’s own conditions.
- “I like the model of scientists, like plant pathologists at Cook College [of Rutgers University], going to the grower with ideas and let the grower think about it. For us it’s been like a revolution in pest control. The experimental stations have scientists to try out compounds regarding their effects on the crop and public safety.”

We suspect that research and technical assistance to promote profitability are justified, given all the public money that has already been spent on farmland preservation and that is destined for that purpose through 2036 and given, also, Burlington County’s geographic marketing advantages. However, as one of the county’s top agricultural leaders argued, such assistance should be part of a package of public policies. His package with rankings consisted of:

⁹³ The text of the question was: “In New Jersey, agricultural land may be assessed for property-tax purposes on the basis of its value in *farm use* rather than its often much higher value in *the real estate market*. How helpful has this law been in keeping property taxes on farmland in Burlington County at acceptable levels?”

⁹⁴ New Jersey Department of Agriculture, 2006, *New Jersey’s Farmland Assessment Act: An Informational Guide on Basic Requirements*, <http://www.nj.gov/agriculture/divisions/md/pdf/primerfarm.pdf> (accessed December 15, 2006).

- “(1) Deed restricted land in large quantities—via PDR [Purchase of Development Rights] or TDR [transfer of development rights]—is a necessary, though not sufficient, condition.
- (2) Recruiting new farmers.
 - (3) Right-to-farm policies.
 - (4) Research funding supported by the growers.
 - (5) Value-added help such as with direct marketing.
 - (6) Water. We may need a water credit bank.”