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Farmland use in an Urban Environment: Status, Trends and Policy Issues

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FARMLAND USE IN AN URBAN ENVIRONMENT:
STATUS, TRENDS AND POLICY ISSUES

by

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FARMLAND USE IN AN URBAN ENVIRONMENT:
STATUS, TRENDS AND POLICY ISSUES

Nelson L. Bills*

New York's land resources have always taken on importance in the production of agricultural commodities. Today, farmers own or lease more than 9 million of the State's 30.6 million acre land area; this land is used to produce feed for the Nation's third largest dairy herd and to produce field, fruit and vine crops valued in excess of \$2.5 billion each year (NYS Agricultural Statistics). Farm businesses also support industries that process raw farm commodities and supply inputs needed for commercial farm production.

Since early settlement, developments in the nonfarm sector of the state and national economies have greatly affected the use of New York land for agricultural purposes. In more recent years, these developments and their influence on New York agriculture have become a focal point for public policy. Numerous programs have been undertaken to promote the wise management of farmland resources. For example, New York is nationally recognized for efforts to protect agricultural lands and promote a viable farm sector through formation of agricultural districts. Efforts to implement and refine such programs, however, have stemmed from specific social,

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political, economic and environmental considerations. These considerations change over time and necessitate continual review and debate over appropriate public policy initiatives.

The purpose of this paper is to facilitate such discussions by highlighting trends in the utilization of land for farming purposes in New York and identifying some of the issues which surround the continuance of agriculture in urbanizing situations. Available evidence on conversion of farmland to urban uses is also summarized and interpreted. A concluding section deals with the implications of these trends and issues for public policy on farmland resources.

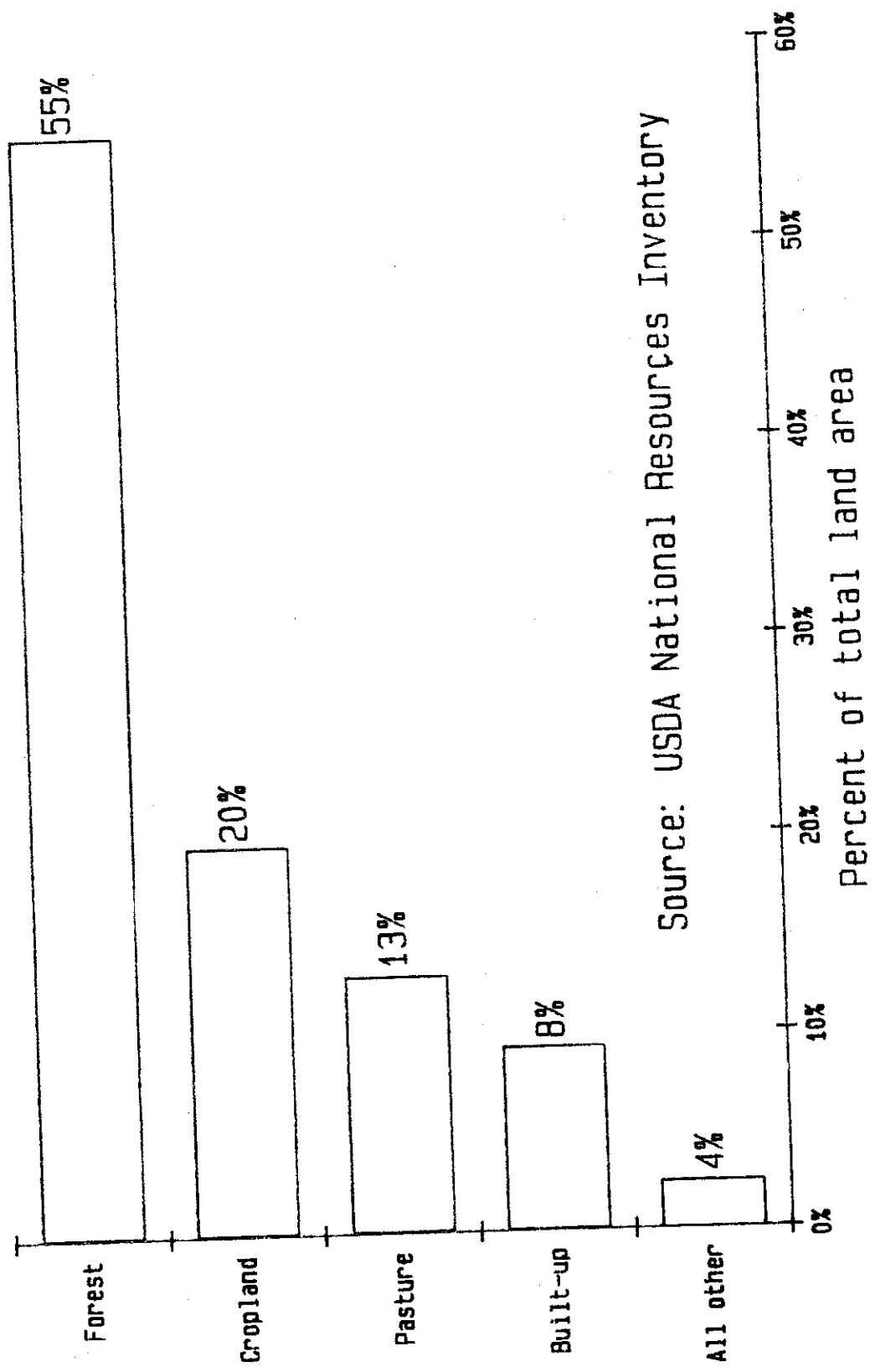
Trends in Agriculture and Rural Land Use¹

New York is one of the Nation's most populous states and, by conventional measures, is among the most urban as well. Yet, only about 2.7 million acres, less than 10 percent of the State's 30.6 million acre land base, are built-up to accommodate residential, commercial, industrial and transportation uses (figure 1). A majority of the land area (55 percent) is now classified as forestland. This acreage includes parks and forest preserves and a substantial land area which has reverted to natural cover after it was released from crop or pasture use. Farm operators now produce crops on 20 percent of all land and use 13 percent for livestock pasture.

Current patterns of land use mirror the influence of several pervasive social, economic and demographic forces dating

¹ This section is based on New York Agriculture 2000 (Boisvert and Bills).

Figure 1: Major uses of land in New York, 1982



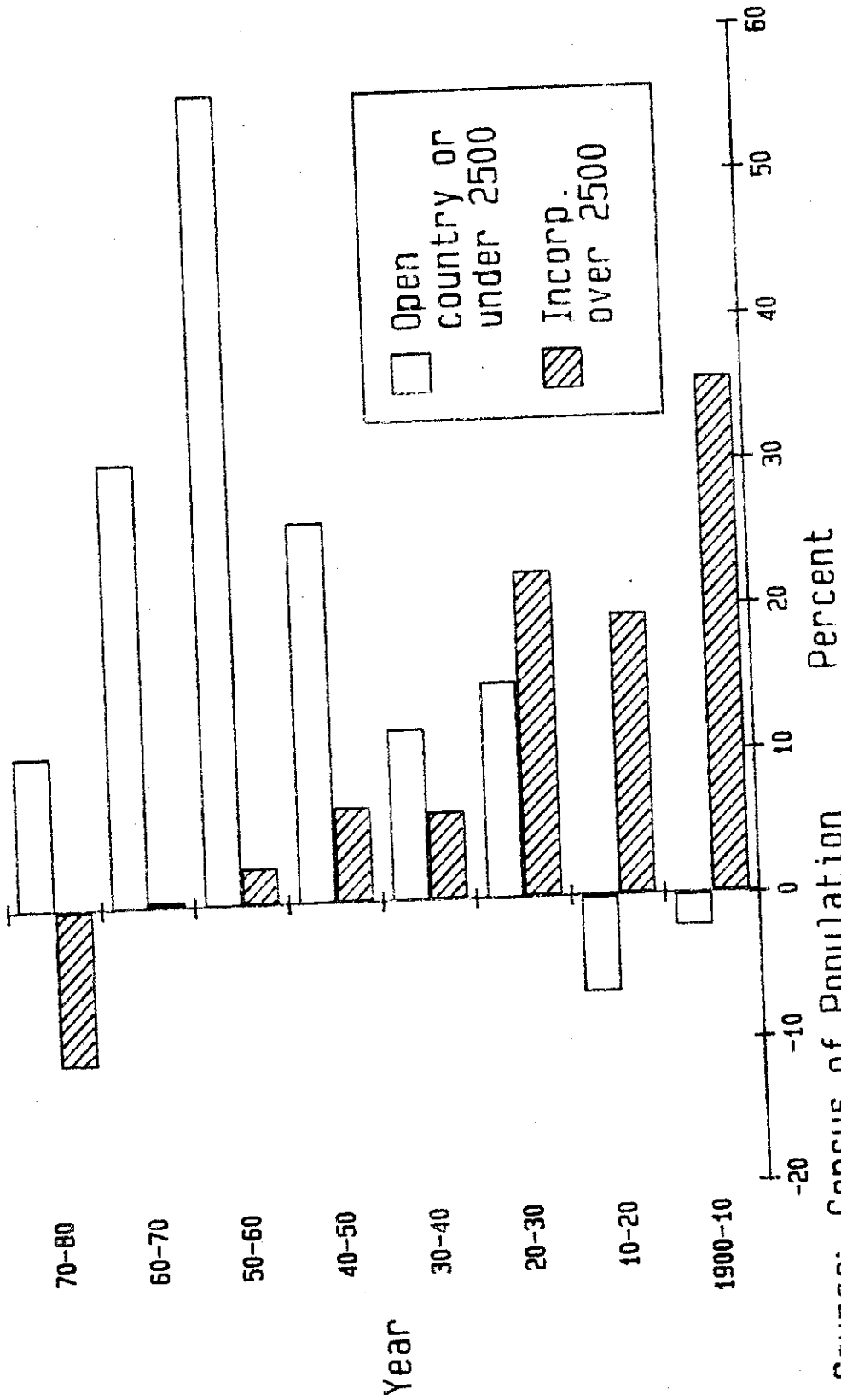
Source: USDA National Resources Inventory

back at least to the turn of the century. In 1900, roughly 70 percent of the State's population was classified as urban because they resided in incorporated places with a population of 2,500 or more. The remainder were counted as rural and resided in open country -- on farms for the most part -- or in small villages or hamlets. Immigration, along with movement from rural areas to expanding job opportunities in urban, commercial and industrial sectors, wholly confined net population growth between 1900 and 1920 to urban areas, while rural New York lost population (figure 2).

In contrast, rural New York has shared in the State's population growth since the 1920s. Although overshadowed in absolute numbers by population increases in larger urban places, well over one million new residents were added to rural areas between 1920 and 1950. After World War II, New York and other states in the Northeast led the Nation in the population explosion in areas adjacent to large central cities. These population concentrations (now commonly known as suburbia or the urban fringe) occurred on land once rural, but now converted to use for urban-related residential, commercial or industrial purposes. In 1950, about 5 percent of New York's total population resided on the urban fringe; but the recent 1980 Population Census counted nearly 5.5 million New Yorkers (about 31 percent) on the urban fringe (U.S. Department of Commerce, 1982).

Since 1950, the Census has increased the land area classified as urban to account for new population concentrations

Figure 2: Rate of population change in open country and incorporated places over 2500 population for New York, 1910-1980

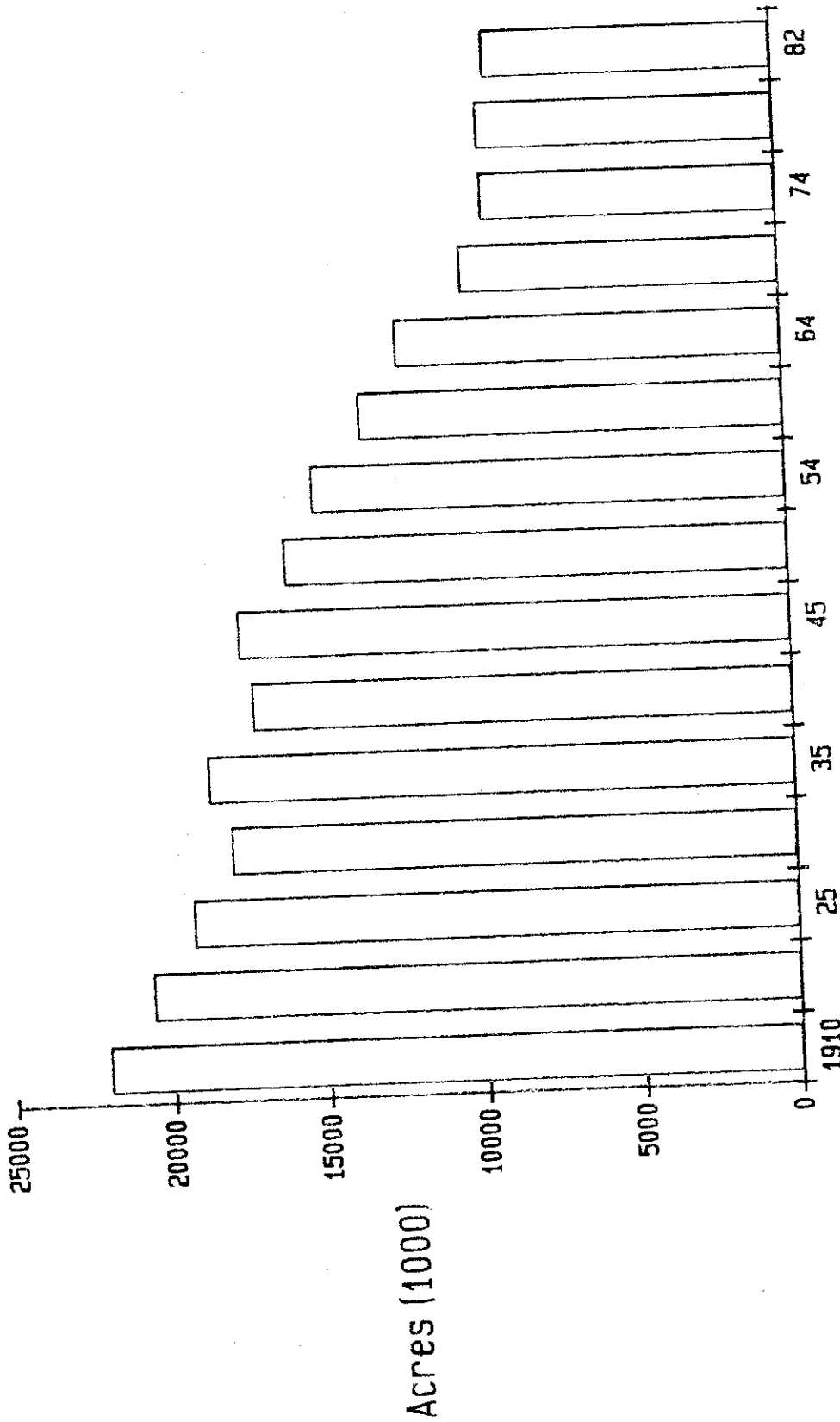


Source: Census of Population

on the urban fringe but outside the boundaries of incorporated cities and villages. The citizens found there are counted as urban. Such data accurately reflect the dynamics of population growth but tend to mask changes that are of special importance to rural land use policy. By recombining Census data for 1950-80 to generate an accounting of population change inside and outside incorporated places with populations of 2,500 or more (as in figure 2), we can show that open country and small hamlets have experienced population growth which, on a percentage basis, has been more rapid than elsewhere in the State since 1930. In fact, since 1960 net population growth has been confined almost exclusively to these "rural" areas.

Along with population growth, rural New York has also been reshaped by structural change in agriculture, especially over the last 50 years. Advances in agricultural productivity, combined with altered supply/demand relationships in the larger agricultural economy, have led to substantial withdrawals of land from farm use, declining farm numbers, and the formation of larger, more specialized farm production units. At the turn of the century, agriculture was the predominant land use in New York, with 74 percent (almost 22.6 million acres) of the land area being actively farmed in 1910. The most recent Agricultural Census reported just over 9 million acres of land in farms (figure 3). Withdrawals of land from farm use were especially abrupt after World War II but

Figure 3. Land in farms for New York, 1910-1982



Source: Census of Agriculture

stabilized in the 1970s when production responded to increases in farm commodity prices.

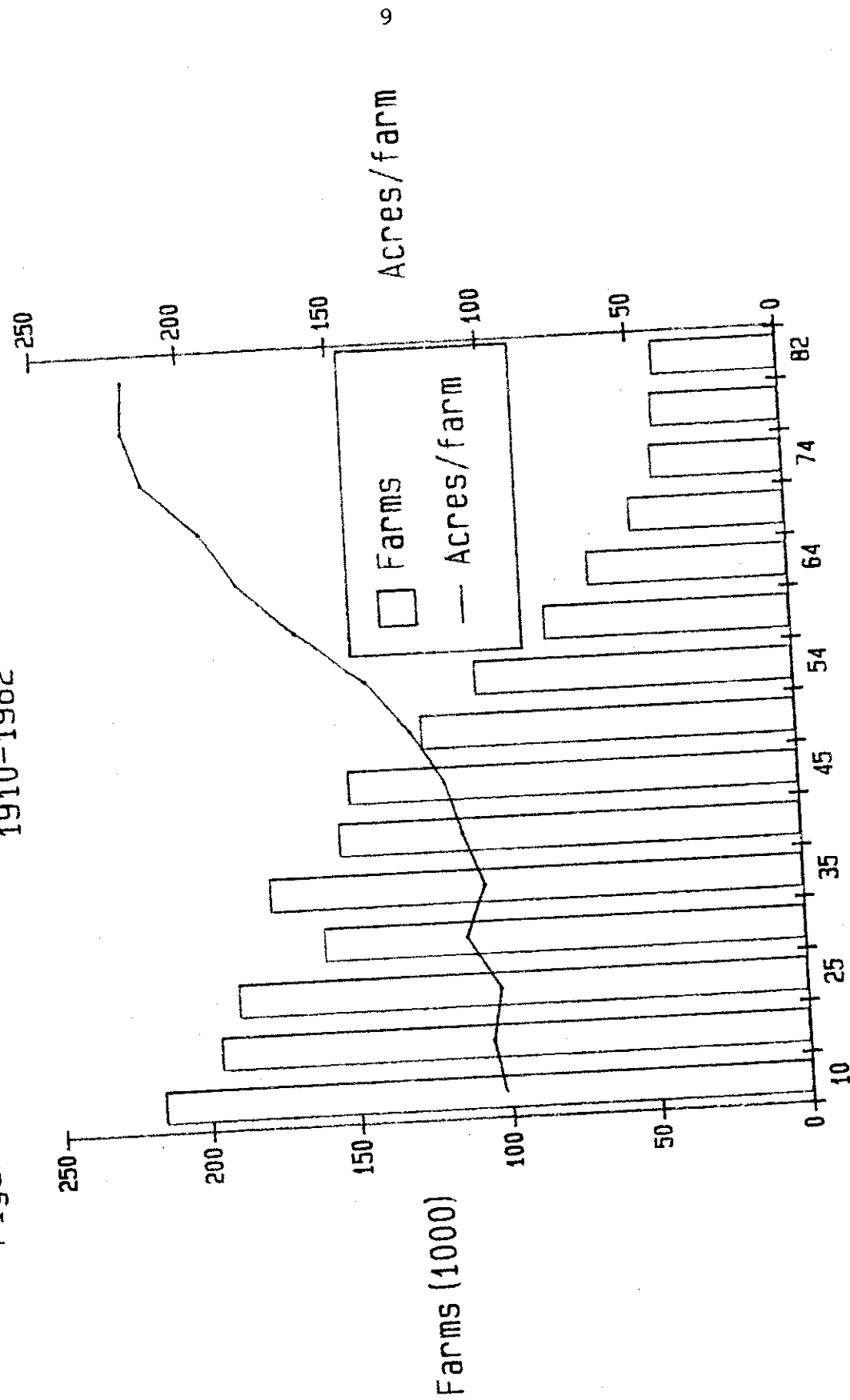
Farm numbers have followed a similar trend over the past 50 years (figure 4), but the decline has been even more dramatic, reflecting the consolidation of small farms into larger and more efficient units. Average farm size stayed relatively unchanged through nearly the first half of the century, but increased rapidly after World War II (growing from 118 acres in 1945 to 214 acres in 1974). There has been little change in farm size over the past decade.

Rapid productivity increases and farm consolidation have helped keep New York producers competitive in regional, national and international markets. Today, businesses engaged in the production of food, feed and other farm commodities in New York generate total cash receipts approaching \$3 billion. After adjusting for commodity price differentials to convert to constant 1967 dollars, this represents about \$1.8 billion, a substantial 59 percent increase in the real value of farm production since the 1950s (figure 5). In contrast, the annual value of output on New York farms, in constant dollar terms, ranged in the vicinity of \$1.1 to \$1.2 billion in the 1930s and 1940s. On a per acre basis, the real value of farm production (1967 dollars) has increased from \$69 to \$191 over the past 30 years.

Urban Land Conversion

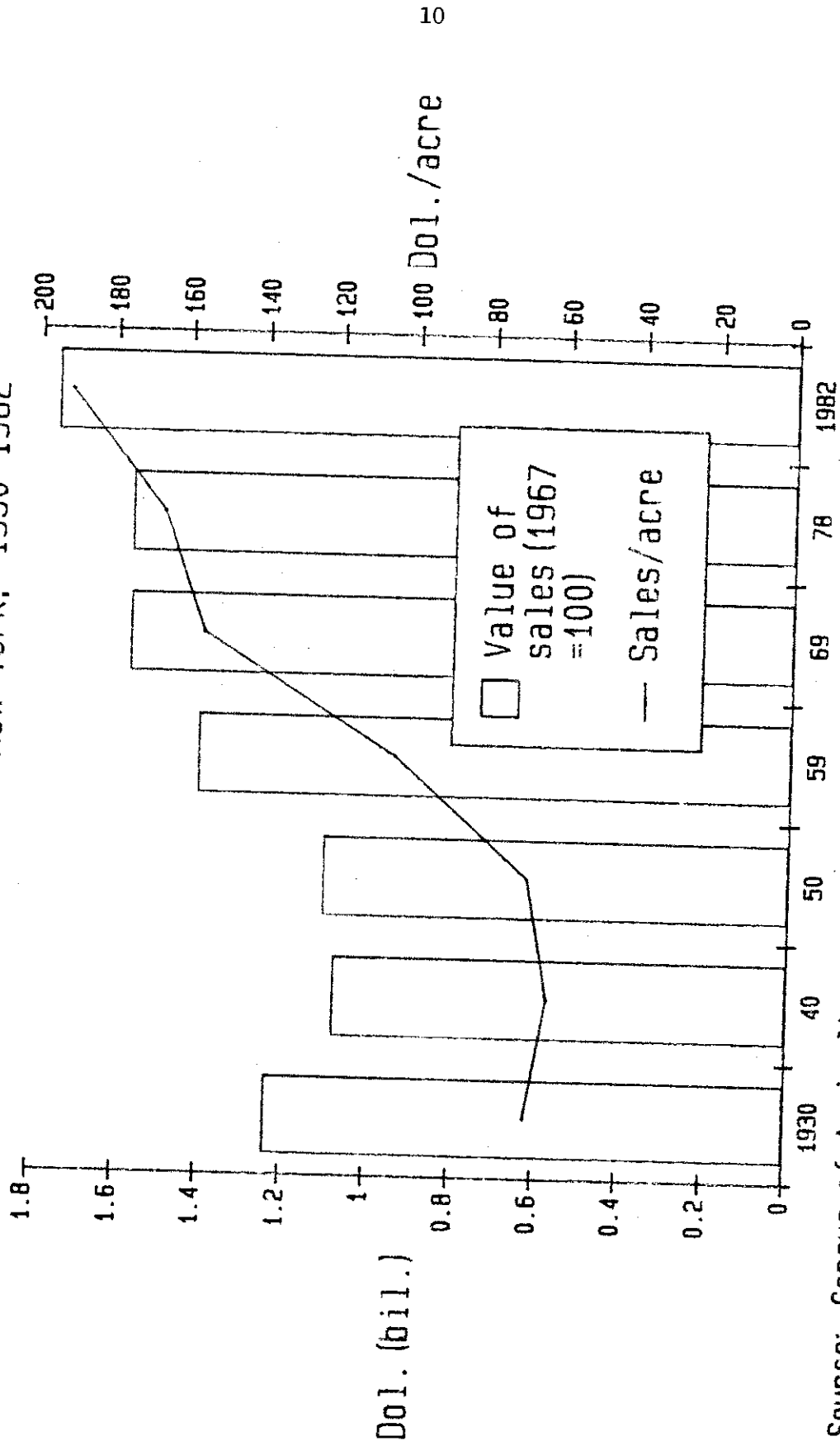
The broad trends mentioned above help illustrate the interplay between rural land use, population growth and

Figure 4. Farms and average farm size for New York, 1910-1982



Source: Census of Agriculture

Figure 5: Real value (1967=100) of farm products sold for New York, 1930-1982



Source: Census of Agriculture and Index of Prices Received by Farmers

economic development in the wider New York economy. By some measures -- such as land in farms or farm numbers -- one might infer that population growth and nonfarm development has largely come at the expense of the New York farm sector. Continual increases in the volume of agricultural production and even more striking gains in the productivity of land remaining in a farm use, on the other hand, provide important evidence to the contrary. We do know that farm operators have achieved these production increases while utilizing far less land and labor inputs. Conversely, farm businesses are now far more dependent upon a wide variety of purchased items -- such as machinery, land improvements, seed, fertilizer, fuel, electricity and chemicals.

Throughout this transition in the structure of the farm sector, nearly 13 million acres (over 40 percent of New York's total land area) has been released from agricultural use but only a fraction of this land has been converted to a built-up use. The overwhelming majority of these resources have remained idle and, over time, have reverted to natural cover. In the aggregate, a return to forestland has been New York's "fast growth" land use since the early 1900s.

Regardless of this general trend, conversion of farmland to residential, commercial, industrial or transportation uses has a direct bearing upon public policy for agricultural land. Too often, land well suited for crop production has the physical and topographical features which also make it well suited for conversion to a residential, commercial, industrial or

transportation use. Possibilities for farmland conversion are also enhanced by patterns of land settlement. In New York, as well as in many other parts of the Nation, settlement tended to occur in close proximity to land which could be turned to a productive agricultural use. Urban growth since the turn of the century has largely reinforced this settlement pattern. Today, some of New York's most productive farmland is situated near metropolitan centers; this land is directly in the path of major road transportation corridors and residential, commercial and industrial development. In contrast, New York has much land which is isolated from urban development but which is far less productive in an agricultural use.

These relationships between patterns of agricultural land use and urban development are generally supported by empirical studies which estimate per capita land use changes. From a comparison of air photos available for 1951 and 1966 in 78 sample towns in Upstate New York, Allee et al. concluded that each additional resident involved the conversion of 0.19 acres to an urban use. Of this amount, 0.08 acres per person, or 42 percent, came from land which was formerly used for crops. In contrast, active cropland was the original use of 29 percent of the total land area in the sample towns. Another 0.1 acres came from "open land"; one cannot be certain, but some of this land could have been cropland recently idled in anticipation of conversion to an urban use.

The Allee study is now out of date, but the empirical relationships found in that analysis are generally supported

by more recent studies by the USDA's Economic Research Service. An analysis of land use changes between 1960 and 1970 in selected "fast growth" counties in the Northeastern states showed that cropland contributed a disproportionately large share of acreage converted to urban uses; this relationship was attributed to the fact that cropland often has features -- such as moderate slope, good drainage and limited waste area -- which make it especially amenable to urban development (Zeimetz et al.). A more recent USDA study, based on 1970-80 photography for fast growth counties, estimates that urban land consumption -- the amount of open land converted to a developed use -- for the Northeastern states amounted to 0.22 acres per person; 60 percent (.13 acres) on average had been used for crops, pasture or some other agricultural purpose (Vesterby and Brooks).

Unfortunately, the studies mentioned above do not provide up-to-date estimates which can be tailored to local situations in New York. We could benefit from more research on this theme. However, the available evidence does allow some crude calculations of the amount of New York cropland converted to urban uses in the recent past. The calculations can then be compared to the total amount of cropland released from a farm use.

The point of departure is an estimate of population increases in New York. The State incurred a net population loss of 3.8 percent between 1970 and 1980 and, according to Census estimates, a very modest 1 percent increase over the

1980-84 period. Net population losses over the entire 1970-84 period, however, have been confined to 87 minor civil divisions -- the five boroughs of New York City, 61 incorporated cities, and 21 towns which can be defined as wholly urban; the remaining 910 minor civil divisions in New York realized a net 1970-84 population increase of about 706,000 (Hirschl, Brown and Lyson). If per capita cropland conversion falls in the range of 0.8-0.13 acres per person, as the evidence implies, population growth between 1970 and 1984 may have displaced between 56,500 and 92,000 acres of cropland. On an average annual basis, this suggests that direct cropland decreases attributable to urban conversion fall in the range of 4,000 to 6,500 acres per year. In comparison, New York's total cropland base decreased from 6.3 to 5.9 million acres, an average annual decrease of 31,300 acres per year, between 1969 and 1982 (Frey, 1973; Frey and Hexem, 1985). Thus, direct conversion to built-up uses may have accounted for 13 to 20 percent of the decrease in the State's cropland base since the early 1970s.

The Side Effects of Urban Growth

Most observers agree that direct land conversion, while the clearest manifestation of urban pressure on farming, understates the impact of growth and development on New York agriculture. Urban expansion often wields more subtle impacts on the maintenance of a viable farm sector. These impacts are thought to be of considerable importance because they encourage good farmland to be withdrawn from or underutilized for

farming many years before it is needed for a residential, commercial, industrial or transportation use.

Uncertainty

Farm operators are also investors. They own several million acres of farm real estate and continually weigh decisions on capital expenditures for land and building improvements. Like all other investors, farmers are not immune to the speculation that can build up around the timing and location of new urban-related development in their communities. Investments in the farm business may be postponed or forgone completely if farmers develop high expectations for future conversion of their land to residential, commercial or industrial use. Postponing or forgoing investments in such land improvements as silos, barns, fences or drainage works can be entirely rational if a farmer anticipates the discontinuance of his business before the improvements are fully depreciated. These investments often add no value to the real estate if the land is converted to a nonfarm use. Conversely, investments of this kind, especially when livestock production is involved, are essential if farm businesses are to remain competitive in regional and national commodity markets.

An uncertain environment for farming, sometimes referred to as the "impermanence syndrome," was central in the deliberations that led to New York's agricultural district law. Studies conducted in the 1960s indicated that speculation over nonfarm growth disrupts farming in belts of urban influence around New York's central cities. For example,

Conklin and Dymsha analyzed farming patterns near Rochester and Syracuse and found an increasing frequency of large investments in land improvements as distance to city increased. The Conklin and Dymsha study also showed that localities within the State differ substantially in their capacity to adjust enterprises and maintain high levels of farm production in the face of urban expansion. Dairy farms require relatively large investments in land improvements, and some dairy farmers were situated on land which appeared to be suited to alternative cash crops instead of dairy crop production. Analysis of enterprise adjustments over the 1959-69 period, however, suggested that farm operators near Rochester produced more high-valued cash crops and were more likely to be successful in a metropolitan area when compared to farm operators near Syracuse. The authors concluded that the Rochester-Syracuse differences stemmed from competitive advantages due to climate, soils, topography and greater availability of irrigation water. They also argued that natural cropland advantages near Rochester were reinforced by an accumulation of management skills and infrastructure required to sustain the production of higher-valued fresh market crops.

Critical Mass

Farm businesses depend upon some very specialized services. Included are requirements for machinery, machinery parts and repairs, fertilizers, pesticides and processing outlets for raw farm products -- services provided by agribusiness firms. Farming in any single locality must occur on a

scale that allows these support firms to generate enough business volume to service their farm clients at a reasonable cost. Otherwise, the services will disappear locally and farm operators are confronted with the time and expense of securing needed services at a greater distance.

Discontinuities in Land Use

Farming in urbanizing situations is carried out in close proximity to other land uses. Farm businesses can be adversely affected by immediate contact with land devoted to residential, commercial or industrial uses. Farming operations required to produce crops and livestock seem to be routine to farm operators but may aggravate otherwise well-intended nonfarm neighbors. For example, nearly one-third of the farm operators contacted in a study near Buffalo indicated that residential development was a disturbing influence on farm businesses due to complaints about farm odors, noise and the presence of mud and manure on roads (Hexem, Bills and Ball).

Development in the vicinity of active farming can also increase the frequency of problems associated with trespass; farm machinery, livestock, crops and farm buildings can often be tempting targets for vandalism. Development inevitably is accompanied by increased traffic congestion on local roads and highways, thus increasing the hazards involved in moving farm machinery in order to conduct field operations.

Property Tax Liabilities

Property tax levies are the most important source of revenue for local governments in New York. Increased expenditures by these units of local government have generated increasingly large tax liabilities for agriculture. Unlike other industrial sectors, farm operators have few, if any, opportunities to shift higher property tax bills forward to consumers through higher prices for raw farm commodities or backwards through more favorable prices for production inputs.

Tax increases on farm real estate can be particularly abrupt in localities influenced by urban growth and development. Assessments on open land in these situations can be increased to reflect its value in a developed use. Tax rates can also increase as local elected officials strive to obtain the revenues needed to fund expanding needs for public goods and services. Tax levies in these situations are sometimes thought to be large enough to induce direct conversion of farmland to a developed use or idle it prematurely while development opportunities continue to ripen.

Criticism of the property tax persists despite legislated efforts to reduce the tax burden on farm real estate. Currently, new farm improvements are exempted from tax levies for a ten-year period. In addition, New York's agricultural district law provides that qualified farmland owners can apply for an exemption on that part of the value of their land that is attributable to speculative or developmental purposes.

Landownership and Control

Throughout New York, farm consolidation and expansion in farm size have been accompanied by a decrease in the incidence of full ownership -- a situation where the farm operator owns all the land operated as a farm. Currently, about 55 percent of New York farmland is operated by part owners; one-fifth of all farmland is owned by individuals or corporations who do not operate a farm (U.S. Department of Commerce).

Although empirical evidence is limited, the pattern of farmland rental and the characteristics of nonfarm landlords appear to vary along a gradient of distance to New York's larger central cities. For example, Bryant studied farm rental and sale markets in Wayne County (near Rochester) and found that the number of farm operators who depend on rented land is inversely related to distance to the central city. That study also implied that about 95 percent of all owners of rented farmland in Wayne County were either rural nonfarm residents or absentee owners.

Changes in the composition of landownership in urbanizing situations means that the commercial farmers who remain must gain access to increasing amounts of land via land rental markets. They must negotiate these arrangements with landlords who often have limited familiarity with production agriculture and uncertain planning horizons for the use of their land.

Comments

Several conclusions follow from the previous discussion and provide some basis for debating new priorities for

state-sponsored farmland protection initiatives. Rural population growth in New York has been a reality for many decades. There is little reason to believe that the influx of population into areas once rural will abate in the foreseeable future. Population growth and attendant employment expansion induces conversion of farmland to new, developed uses and can produce debilitating side-effects for the farm businesses that remain.

Yet, after more than 300 years of settlement, less than 10 percent of New York's land area is built-up to accommodate urban and transportation uses. In fact, urban development has accounted for only a small fraction of the land released from agricultural uses since the turn of the century. The bulk of the acreage released is obsolete for farming purposes and has reverted to natural cover after remaining idle for many years. It is now classified as forestland. Reduced agricultural land use has principally come in the wake of major structural adjustments in the New York farm sector. These structural adjustments have, for the most part, concentrated commercial farming on land which is best suited to crop production and the most responsive to technological advances in a modern agriculture. Impressive increases in productivity have been realized for land remaining in farm use.

Looking to the future, it also seems clear that a fraction of the State's current farmland base is at risk because it is situated near corridors of urban expansion and is, due to its physical and topographical features, prone to future

development. Research has consistently shown that development is tilted toward land devoted to a crop use.

It should also be emphasized that the vulnerability of good farmland to outright conversion is greatly affected by factors at work in the farm sector and in the wider economy. In general, the stage is set for such land use changes when the farm economy is plagued by low incomes and sluggish demand for raw farm commodities and when the nonfarm economy is expanding. Predictions are dangerous, but much of the 1980 decade has been characterized by just such conditions -- stagnant farm incomes and expansion in the nonfarm sector of the New York economy. These conditions tend to disadvantage policies and programs designed to encourage the maintenance of farmland in its current use.

Equally significant is the fact that the economic health of New York agriculture is largely determined by its competitive position in regional and national markets for farm commodities and by farm policies enacted by the U.S. Congress. These considerations are almost entirely beyond the scope of state and local programs and policies for rural land use. This means that such policies, regardless of the skill demonstrated in their design, do not necessarily secure the future of New York agriculture.

Conversely, the vitality of agriculture is dependent upon quick and ready access to high-quality land resources. Programs and policies which facilitate these arrangements are to the advantage of all New York citizens. A challenge is to

fashion effective policies for growth management -- programs which accommodate the State's very real needs for housing and economic development without compromising prospects for a dynamic and competitive agriculture.

References

- Allee, David, et al. Toward the Year 1985: The Conversion of Land to Urban Use in New York State. Special Series Number 8, New York State College of Agriculture, Cornell University, Ithaca, NY. 1969.
- Boisvert, Richard N. and Nelson L. Bills. "Farmland Protection in New York State." In Toward a Long-term Strategy for Farmland Protection and Soil and Water Conservation in New York, A New York Agriculture 2000 Report. Published for Mario M. Cuomo, Governor, New York State, Albany, NY. No date.
- Bryant, William R. The Rural Land Market in Wayne County, New York. A.E. Res. 74-8, Department of Agricultural Economics, Cornell University, Ithaca, NY. August 1974.
- Conklin, Howard E. and Richard Dymysza. Maintaining Viable Agriculture in Areas of Urban Expansion. New York State Office of Planning Services, Albany, NY. 1972.
- Frey, H. Thomas. Major Uses of Land in the United States, Summary for 1969. Agricultural Economic Report No. 247, Economic Research Service, U.S. Department of Agriculture, Washington, DC. December 1973.
- Frey, H. Thomas and Roger W. Hexem. Major Uses of Land in the United States: 1982. Agricultural Economic Report Number 535, Economic Research Service, U.S. Department of Agriculture, Washington, DC. June 1985.
- Hexem, Roger W., Nelson L. Bills and Sally Ball. Agricultural Districts and Land Use: A Pilot Study. A.E. Research 80-29, Department of Agricultural Economics, Cornell University, Ithaca, NY. November 1980.
- Hirschl, Thomas A., Warren A. Brown, and Thomas A. Lyson. Rural New York in a Post-Urban Industrial Society. Department of Rural Sociology, Cornell University, Ithaca, NY. February 1988.
- New York State Department of Agriculture and Markets, New York Agricultural Statistics Service. New York State Agricultural Statistics, 1986. Albany, NY. June 1987.
- U.S. Department of Agriculture, Soil Conservation Service. National Resources Inventory. Washington, DC. No date.
- U.S. Department of Commerce, Bureau of the Census. 1982 Census of Agriculture: New York. Vol. 1, Pt. 32, U.S. Government Printing Office, Washington, DC. 1983.

U.S. Department of Commerce, Bureau of the Census. 1980 Census of Population: New York. Vol. 34, No. 1 (Number of Inhabitants), U.S. Government Printing Office, Washington, DC. 1982.

Vesterby, Marlow and Douglas H. Brooks. Land Use Change in Fast-Growth Areas, 1950-1980. Draft paper presented at the Economic Research Service and Farm Foundation's workshop on "Land Use Transition in Urbanizing Areas: Research and Information Needs." Washington, DC. June 6-7, 1988.

Zeimetz, K.A., E. Dillon, E.E. Hardy, and R.C. Otte. Dynamics of Land Use in Fast Growth Areas. Agricultural Economic Report No. 325, Economic Research Service, U.S. Department of Agriculture, Washington, DC. 1976.