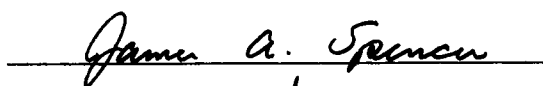
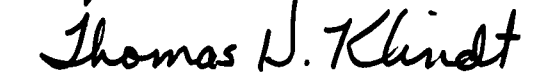


To the Graduate Council:

I am submitting herewith a thesis written by V. Gail Easley entitled "An Assessment of Needs and Strategies for the Preservation of Agricultural Lands." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science in Planning.


Kenneth B. Kenney, Major Professor

We have read this thesis
and recommend its acceptance:

Accepted for the Council:


Vice Chancellor
Graduate Studies and Research

Thesis
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AN ASSESSMENT OF NEEDS AND STRATEGIES
FOR THE PRESERVATION OF
AGRICULTURAL LANDS

A Thesis
Presented for the
Master of Science in Planning
Degree
The University of Tennessee, Knoxville

V. Gail Easley

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This thesis is the culmination of nearly two years of study and work at the Graduate School of Planning. None of it would have been possible without the support of my family. My children, Denise and John, have shown consideration and understanding and have been supportive during my schooling and the writing of my thesis. However, very special acknowledgment and thanks must go to my husband, Bill Farrell, without whose love, understanding, and support, none of this could have been possible.

ABSTRACT

The purpose of this thesis is to address the issue of agricultural land preservation. There are conflicting opinions regarding the preservation or conversion of agricultural land. Therefore, the need for agricultural land preservation is examined. Programs and strategies for the preservation of agricultural land are discussed. Finally, factors to be considered in the decision to retain or convert farmland are discussed.

Information was gathered in two ways. A search and review of the available literature was conducted. Second, personal contacts were made with planners and/or agricultural economists in the 50 states. Letters were sent to state planning offices in each state; 35 replies were received.

It was found that, while agricultural land is undergoing continued conversion to other uses, this conversion does not appear to represent a serious threat to the production of food and fiber to meet national needs. At state and local levels, however, the need to preserve agricultural land is based upon objectives other than protecting production capabilities. Such objectives might be preserving open space in the form of farmland, controlling urban expansion, or preserving agriculture as a significant economic activity.

Several approaches have been suggested in preserving

agricultural land. No single program is likely to work in all situations. In fact, a combination of programs may prove to be the best approach to agricultural land preservation.

Little has been written on the factors to be considered in the decision to retain or convert farmland. The identification and classification of agricultural land is an important initial step in selecting land to be included in a preservation program. Characteristics of the land itself, characteristics of the landowner, and characteristics of the surrounding area are all important inputs into the decision to retain or convert farmland.

Approaching the agricultural land preservation issue through the traditional planning process can address the many conflicts in balancing agricultural land use needs with other land uses. The result could be a clarification of goals, collecting and analyzing data on land uses, considering alternative strategies in agricultural land preservation, and establishing criteria for the decision to preserve or retain farmland. The planning process can accommodate the changing needs for land for a variety of uses.

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CHAPTER I

INTRODUCTION

Land is a limited resource. Through most of United States history there has been little or no concern for conservation of natural resources, including farmland. There was a seemingly endless supply of natural resources and an abundance of high quality agricultural land. As the land was put to other uses, or worn out from farming, people could move to new land or to the frontier. However, resource depletion and population growth have led to a new national concern for resource conservation. Within this new resource conservation ethic, there is today a perceived need to retain the best agricultural lands to insure the continuation of farming to produce food and fiber to supply this nation's people. This is not the only objective in agricultural land preservation, however. Farmland retention may work to preserve open space, control urban sprawl, enhance the state or local economy, or improve the visual quality of the landscape.

The pattern of land uses is constantly changing. Agricultural uses in 1973 accounted for approximately 57% of the total land area in the United States.¹ These uses

¹Thomas F. Hady and Ann Gordon Sibold, State Programs for the Differential Assessment of Farm and Open Space Land, Agricultural Economics Report No. 256 (Washington, D.C.:

include cropland, grazing and pastureland, forests, and timber land or woodland. Of these uses, cropland is the most intensive, requiring land with the fewest limitations. Land in urban uses accounts for less than 3% of the total land area.² Over the years the amount of land in agricultural uses, especially cropland, has been diminishing, while land in urban uses has been increasing. Federal farm programs have diverted some of the cropland for purposes of soil conversion and improvement. Intensive urban uses have accounted for losses not only in cropland, but also in other agricultural land.

There are other factors which may affect the allocation of land resources and the patterns of land use. Due to advances in science and increases in technology, agricultural land productivity has increased at a greater rate than the population growth rate since World War II. Therefore, fewer acres have been required for the production of food and fiber to meet the domestic needs in the United States. This trend is not likely to continue however. Regulations on the use of pesticides and fertilizers affect the productivity of farmland. As chemical uses are restricted, more land will likely be required for the same production. Fuel costs, as well as fertilizer costs, are

Economic Research Service, 1974) pp. 2-3.

²Ibid.

rapidly rising. Land, therefore, may become a relatively more important input into future farm production.

More widespread attention to losses of farmland through conversion to urban and other uses, the stricter regulation of chemicals used in farming, a growing emphasis on the protection of environmentally sensitive or unique lands, and increased attention to the aesthetic and open space attributes of farmland have resulted in the concern for agricultural land preservation which has been evident over the past few years. However, there is disagreement among planners, land economists, farmers, and others concerned with agricultural land preservation. This disagreement is with regard to the impact of farmland conversion and the urbanization of important agricultural lands. Some view cropland conversion as the "loss" of land and a threat to the production of agricultural commodities. However, there is a growing body of literature to support the view that the United States is not running out of farmland nor is its agricultural productivity being compromised.

This view holds that cropland conversion is merely a part of the changing land use patterns and no cause for alarm. Agricultural lands which are converted are not all converted to urban uses. Much land is shifted from cropland uses to lower intensity uses (forestry, for example) or is left idle as cropping becomes less profitable. Even as some croplands are put out of use, new croplands are

established. Reclamation of previously idle cropland, irrigation of dry lands, drainage of marsh lands or other wet lands, clearing forested areas, or releasing land from federal land management programs can also increase the cropland base.³

The need to insure an adequate future food supply does not necessarily result in an increased concern for protecting agricultural land. A concern for food supplies is largely a national issue; land use regulation is a state and local concern. Agriculture directly affects economic, social, and environmental issues at the state and local level. Therefore, farmlands may be of state or local importance due to location and a concern for open space, environmental quality, visual quality, or economic impacts rather than the production capability.

The Farmland Preservation Decision

The planner should have a major role in land use decisions for agricultural land, particularly that on the urban fringe. However, information is needed for planners and decision-makers to evaluate land use decisions for agricultural lands under conversion pressure. Extending

³U.S. Department of Agriculture Committee on Land Use, Recommendations on Prime Lands, Report from the Seminar on the Retention of Prime Land, (Washington, D.C.: U.S. Department of Agriculture, 1975).

the use of conventional planning tools into rural/agricultural areas may not be adequate.⁴ Not only must planning for rural areas be carried out in light of differing goals, values, lifestyles, and land uses, there must also be some means to identify prime, unique, or important farmlands under conversion pressure. Once identified, there must be some means to effectively preserve this land where it is desirable to do so.

The first agricultural land preservation efforts, primarily preferential tax treatment, were generally not very effective. New preservation programs are being tried and the land allocation decisions regarding agricultural land are being removed from the market-place. However, the economic cost and benefit considerations concerning these land use decisions have not been adequately explored.⁵ More information is needed in order to identify and evaluate the qualitative as well as quantitative costs and benefits associated with retaining agricultural land in active production versus converting this land to non-agricultural uses.

Techniques are now in use by the Soil Conservation Service to identify and map prime farmlands, unique

⁴Scott Lefaver, "A New Framework for Rural Planning," Urban Land, Vol. 37, 1978, pp. 7-13.

⁵B. Delworth Gardner, "The Economics of Agricultural Land Preservation," American Journal of Agricultural Economics, December, 1977, pp. 1027-1036.

farmlands, or farmlands of local importance. Criteria used in this identification include such considerations as soil type and depth, drainage, slope, permeability and so forth. A question to be addressed, then, is whether or not prime farmland should be preserved or "saved" from conversion to other uses and under what circumstances it should be considered for preservation. Many factors in addition to the production of food and fiber must be considered in the preservation decision--factors such as the contribution of agriculture to the local economy, the multiplier effects of the agricultural industry in the community, the need for the agricultural land for other uses, alternate locations for the various land uses, and so forth. These factors need to be clearly identified in order to be included in the decision-making process.

Purpose/Objectives

The purpose of this thesis is to address the issues and conflicting opinions regarding agricultural land preservation and the conversion of agricultural land to other uses. At the present time there is interest across the country in agricultural land losses and conversion, and in preserving agricultural land. Many state and local planning agencies have undertaken studies of agricultural land preservation. Interest in the issue is not limited to planners, however. Attorneys, land economists, political scientists, farmers, and citizens are interested

and concerned. Perhaps it is now time for a major research effort to be undertaken regarding agricultural land preservation. A necessary preliminary step in such research is the establishment of an adequate framework upon which to build and test theories related to decision-making for agricultural land under conversion pressure. This framework would consist of a study of the issues--the need to preserve agricultural land, an evaluation of past and present efforts to preserve agricultural land, an examination of goals and policies which guide action at each level of government, and an examination of the many factors which are involved in decisions regarding agricultural land preservation or conversion. This thesis represents the framework for such future work. Specifically, the objectives of this study are:

- 1) to examine the differing perceptions and opinions regarding the need to preserve agricultural land, including goals and objectives of preservation programs,
- 2) to review and analyze past and present actions to preserve agricultural land and control agricultural land conversion,
- 3) to identify factors in the agricultural land preservation/conversion process, and to identify and discuss methods for both the identification and selection of agricultural land for preservation.

Chapter II is a review of the differing perceptions of the need to preserve agricultural land. It can be documented that certain types of agricultural land undergo

conversion to other uses. Such evidence does not provide the greatest motive, however, in state and local action to save farmland. This chapter is an examination of the goals and policies guiding action at all levels of government.

Much has been written about types of programs implemented or available to preserve agricultural land. Some programs have been widely used; others have been suggested but not yet tried. In Chapter III these programs are discussed and evaluated. This chapter is a review of preservation programs as well as an examination of the advantages and disadvantages of these programs. Current and proposed preservation programs are discussed.

In Chapter IV the key factors in the agricultural land decision process are presented. Specifically, the identification and classification of agricultural land is discussed, as well as factors to be included in selecting agricultural land for preservation. Some attention is given to a methodology for selection.

Chapter V contains the recommendations and conclusions arising from this study. How and why are considerations of agricultural land conversion important to planners and the planning profession? There is also a discussion of the use of the findings of this study, and the need for additional research.

Methodology

Information contained in this thesis has been gathered in two ways. A search and review of the literature was conducted. This review yielded considerable information on agricultural land preservation, specifically the need for preservation and strategies for preservation. Additional information was gathered through personal communication. A letter was prepared outlining the nature of this study, and the need for additional information. This letter was sent to the State Planning Office in each of 50 states. Specifically, the letter requested copies of legislation for agricultural land preservation, reports on state or local programs, copies of pending legislation, or related material. Responses were received from 35 states. Information on farmland preservation activities in the remaining states was provided from many other sources--communication with researchers at land grant institutions, information in the published literature, and unpublished drafts or working papers on this topic. Much of the information gathered for this thesis is presented in tables developed by this author. These tables are shown in Chapters III and IV.

CHAPTER II

DIFFERING PERCEPTIONS OF THE NEED TO PRESERVE AGRICULTURAL LAND

Frequently legislation is passed or proposed at state and local levels of government with the stated or implicit purpose of preserving agricultural lands from conversion to other uses. This may be perceived to be necessary for a variety of reasons: maintaining agricultural production and its contribution to the state/local economy, maintaining an adequate supply of food and farm products, relieving the economic pressures to convert farmland to other uses, or controlling urban expansion. While there may be a perceived need to save farmland, not all of those individuals examining the agricultural land preservation issue agree that agricultural land conversion represents a problem, or poses a threat to supplies of food and fiber.

The purpose of this chapter is to present a review and discussion of the differing perceptions of the need to preserve agricultural land. These differing perceptions arise from the variation in the interpretation of the statistics on land uses and changes in land uses over time. Following a discussion of this variation is an examination of goals and policies which are concerned with agricultural land preservation. While a few state and local governments have specifically stated goals and policies, many statements

of goals and policies are implied in preambles to legislation indicating legislative intent or purpose. In other cases, the purpose, or policy, is not a part of a written record. There is also a review of federal policy as it relates to agricultural land and its use.

The Need for Preservation

While there may be a need to preserve prime agricultural lands, for crop production for example, there may be adequate pastureland to serve this country far into the future. Furthermore, certain agricultural lands may be "disappearing" at alarming rates in one or two states while the national supply is relatively stable. The question to be addressed, therefore, is complex. Is there a need to save all agricultural lands, cropland, pastureland, forests, or unique farmlands? Is the issue saving agricultural land, or saving agriculture? For some states and localities, agriculture may be the largest single element contributing to the economy of the state. Farmland may be undergoing rapid conversion to other uses, causing the loss of open space or an aesthetically pleasing rural landscape. Although it may be a smaller input into the economy, the "need" to save such farmland may actually be a desire to control suburban growth or urban expansion or to maintain open space near the city.

Definitions

Agricultural land or farmland encompasses a wide range of land uses. The following discussion deals with

forest lands, crop lands, prime land, and others. Therefore, a definition of terms may be useful.

In the Census of Agriculture the following definitions are used. Farmland is agricultural land used for crops, pasture or grazing, woodland, or wasteland if it is a part of the farm operator's total operation. Cropland includes cropland harvested, used for pasture or grazing, cover crops, on which all crops failed, in cultivated summer fallow, or idle, orchards, groves, vineyards, nursery and greenhouses.¹

The Soil Conservation Service defines prime farmland as:

land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses (the land could be cropland, pastureland, rangeland, forest land or other land, but not urban built-up land or water). It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed, according to acceptable farming methods.²

There are eight capability classes of soils, ranging from Class I, soils with few or no limitations for development, to Class VIII, soils with severe limitations for use.

¹U.S. Department of Commerce, Census of Agriculture (Washington, D.C.: Department of Commerce, Bureau of Census, 1974), p. ix.

²Prime and Unique Farmlands, Federal Register Vol. 43, No. 21, Part 657, January 31, 1978, pp. 4030-4032.

Generally, Classes I, II, and III are considered prime. Descriptions of all eight classes are shown in Appendix A.

It has been stated that a major reason for concentrating on issues of agricultural land preservation is the obvious importance of food production areas for the well-being of the nation and the world.³ There is some agreement that the United States is not "running out" of farmland.⁴ However, there is also widespread discussion on the annual "loss" of agricultural lands. This may be farmland, cropland, or prime agricultural land. The nature of the loss may be the irreversible (for practical purposes) conversion of this agricultural land to other uses. On the other hand, agricultural land may be idle for economic reasons or as part of a management program. Disagreement arises over the implications of this loss, the potential replacement

³Robert E. Coughlin and others, Saving the Garden: The Preservation of Farmland and other Environmentally Valuable Land, (Philadelphia: Regional Science Research Institute, 1977), pp. 22-25.

⁴Especially refer to William D. Anderson, Gregory C. Gustafson, and Robert F. Boxley, "Perspectives on Agricultural Land Policy," Journal of Soil and Water Conservation, Vol. 30, 1975, pp. 36-43; Raymond I. Dideriksen and R. Neil Sampson, "Important Farmlands: A National View," Journal of Soil and Water Conservation, Vol. 31, 1976, pp. 195-197; Philip M. Raup, "Urban Threats to Rural Lands: Backgrounds and Beginnings," Journal of American Institute of Planners, Vol. 41, 1975, pp. 371-378; Melvin L. Cotner, Land Use Policy and Agriculture: A State and Local Perspective, ERS-650 (Washington, D.C.: U.S. Department of Agriculture, 1977); Linda K. Lee, A Perspective on Cropland Availability, AER 406 (Washington, D.C.: U.S. Department of Agriculture, Economics, Statistics and Cooperatives Service, 1978).

lands available, and the actual number of acres involved.

A recent study by the Economics, Statistics, and Cooperative Services of the United States Department of Agriculture indicates that some agricultural land is lost to irreversible and competing land uses.⁵ At the same time, land with lower quality soils is being added to the cropland base. The quality of lands shifting uses is a major concern. Table 1 shows data on the amount of land in various soil capability classes which was irrevocably lost to other uses between 1967-1975. The principal processes affecting agricultural land in the U.S. were urbanization, highway construction, and reservoir construction. In terms of the prime farmland, it is estimated that seven million acres were converted to urban and water uses between 1967 and 1975 (Table 2).

Despite these permanent losses of agricultural land, the percentage of Classes I, II, and III land used for crops actually increased from 83% to 86%. This increase is reflected in the high percentages of Classes I, II, and III land added to cropland from pasture and range, forest, and other land (Table 3). The concern that export demand and the need to replace land lost to irreversible uses could result in adding marginal land to the cropland base

⁵Lee, loc. cit.

TABLE 1. Capability Class, by Region, of Agricultural Land Converted to Urban, Built-up, or Water Uses, 1967-1975.

Region ¹	Capability Class							Total Acreage (1,000 acres)
	I	II	III	IV	V	VI	VII	
	(Percent)							
	--urban and built-up uses--							
Northeast	2.5	33.4	27.6	5.8	0.3	9.9	20.6	2,796
Lake	3.4	33.3	33.9	22.9	0	2.2	.3	1,231
Corn Belt	9.6	41.2	21.6	9.8	3.9	6.5	7.3	2,149
Northern Plains	3.1	44.5	34.2	0	0	18.2	0	868
Appalachian	6.0	23.4	21.0	20.8	1.4	10.0	17.6	2,183
Southeast	15.5	28.7	10.6	32.5	3.0	9.0	0.8	2,615
Delta	3.8	48.0	34.9	3.0	0	10.3	0	800
Southern Plains	0	30.0	9.4	17.4	2.4	22.1	18.8	1,170
Mountain	1.4	7.6	5.4	38.3	1.5	13.9	32.0	1,242
Pacific	17.0	13.5	29.5	7.8	0	14.8	17.4	1,318
Total (48-state)	7.0	29.8	21.6	16.9	1.5	10.8	12.5	16,373
--water--								
Northeast	0	13.8	61.8	1.5	4.1	6.7	12.1	477
Lake	0	0	65.5	0	0	0	34.5	140

TABLE 1 (continued)

Region ¹	Capability Class							Total Acreage (1,000 acres)
	I	II	III	IV	V	VI	VII	
				(percent)				
Corn Belt	27.0	18.4	8.1	23.7	0	9.0	13.7	575
Northern Plains	0	28.6	0	0	0	0	71.4	289
Appalachian	0	21.6	16.6	30.0	0	13.4	18.4	269
Southeast	0	0	30.4	3.3	5.6	0	60.7	3,278
Delta	0	16.4	25.4	17.5	19.4	0	21.2	144
Southern Plains	0	26.5	17.0	7.1	33.2	16.1	0	1,321
Mountain	0	0	6.7	8.2	0	2.8	82.2	82
Pacific	0	0	0	0	0	0	100.0	110
Total (48-state)	2.3	10.3	26.1	6.8	10.0	5.0	39.4	6,682

¹Regions are: Northeast: Maine, New Hampshire, Vermont, New York, Massachusetts, Connecticut, Rhode Island, New Jersey, Pennsylvania, Maryland, Delaware; Lake: Michigan, Wisconsin, Minnesota; Corn Belt: Ohio, Indiana, Illinois, Missouri, Iowa; Northern Plains: North Dakota, South Dakota, Nebraska, Kansas; Appalachian: West Virginia, Virginia, North Carolina, Kentucky, Tennessee; Southeast: South Carolina, Georgia, Florida, Alabama; Delta: Mississippi, Louisiana, Arkansas; Southern Plains: Texas, Oklahoma; Mountain: New Mexico, Colorado, Wyoming, Montana, Idaho, Nevada, Utah, Arizona; Pacific: California, Oregon, Washington.

Source: Linda K. Lee, A Perspective on Cropland Availability, AER406 (Washington, D.C.: U.S. Department of Agriculture, 1978), pp. 14-15.

TABLE 2. Prime Farmland Converted to Urban and Water Uses, by Region, 1967-1975.

Region	Urban	Water (1,000 acres)	Total
Northeast	970	90	1,060
Lake	440	10	450
Corn Belt	1,120	260	1,380
Northern Plains	440	70	510
Appalachian	660	30	690
Southeast	1,150	230	1,380
Delta	460	40	500
Southern Plains	390	460	850
Mountain	100	1	101
Pacific	460	0	470
Total (48-state)	6,200	1,191	7,391

Source: Linda K. Lee, A Perspective on Cropland Availability, AER 406 (Washington, D.C.: U.S. Department of Agriculture, 1978), p. 17.

Table 3. Capability Class of Land Converted to Cropland, by Region and Previous Use, 1967-1975.

Region	Capability Class (percent)						Total Acreage (1,000 acres)	
	I	II	III	IV	V	VI VII-VIII		
--Pasture and Range--								
Northeast	0	34.1	38.4	15.0	0	11.6	0.8	1,476
Lake	0	29.1	41.5	28.3	0	1.1	0	2,236
Corn Belt	7.8	40.2	28.0	13.7	1.3	6.2	2.8	4,930
Northern Plains	7.4	32.5	16.7	15.8	1.3	24.8	1.4	5,950
Appalachian	6.2	41.2	31.9	13.4	0.8	5.5	0.9	3,227
Southeast	6.3	52.1	15.9	18.8	0	6.9	0	1,873
Delta	2.9	56.6	29.7	3.8	1.8	2.7	2.6	1,638
Southern Plains	0	25.9	48.8	16.8	0.5	8.0	0	3,311
Mountains	4.6	22.3	28.6	22.3	0	18.6	3.5	5,642
Pacific	0	29.7	27.2	38.4	0	4.7	0	1,586
Total (48 state)	4.6	34.2	29.3	18.0	0.7	11.7	1.6	31,869
--Forest--								
Northeast	0	34.3	23.1	13.5	0	24.5	4.6	1,397
Lake	1.7	36.0	17.9	33.0	0	11.4	0	1,163
Corn Belt	9.6	38.1	24.2	16.2	0	6.6	5.0	1,300
Northern Plains	0	54.7	29.4	0	0	0	15.9	166
Appalachian	10.5	35.7	19.8	12.0	12.6	0	9.5	1,907
Southeast	3.5	36.1	25.9	26.4	0	7.0	1.1	2,220
Delta	0	11.5	51.8	12.9	22.2	1.5	0	2,104
Southern Plains	0	46.8	14.0	0	0	39.2	0	329
Mountains	0	0	100.0	0	0	0	0	2
Pacific	2.5	20.7	18.5	47.4	0	10.8	0	367
Total (48 state)	3.9	31.4	27.9	18.6	6.5	8.4	3.3	10,955

TABLE 3. (continued)

Region	Capability Class						Total Acreage (1,000 acres)
	I	II	III	IV (percent)	V	VI VII-VIII	
--Other Land--							
Northeast	0	37.0	43.1	9.9	0	9.7	837
Lake	1.7	55.5	15.2	14.8	0	8.3	1,085
Corn Belt	11.8	52.8	22.1	5.9	0	0	1,181
Northern Plains	0	66.4	11.3	7.3	0	9.5	629
Appalachian	19.0	40.3	25.8	2.8	7.1	4.9	811
Southeast	3.7	47.6	34.3	4.7	0	9.6	406
Delta	0	40.3	59.7	0	0	0	225
Southern Plains	0	40.3	59.7	0	0	0	216
Mountains	1.8	12.5	73.1	6.6	0	6.0	364
Pacific	0	69.3	0	30.6	0	0	73
Total	5.7	46.3	30.7	7.7	1.0	5.8	5,827

Source: Linda K. Lee, A Perspective on Cropland Availability, AER 406 (Washington, D.C.: U.S. Department of Agriculture, 1978), p. 18.

was not documented in Lee's study. Rather, it was found that land shifted into cropland use was generally high quality.

This view is supported in a report prepared by Cotner.⁶ While the annual loss in cropland is approximately 2.7 million acres, 1.3 million acres are added to the cropland base each year through expanded irrigation, drainage, clearing, and dryland farming. According to this report, the new cropland is on more productive soils whereas lost cropland has been mostly of lower quality. Furthermore, there are approximately 266 million tillable acres presently in pasture or forest use. Of these, about 100 million acres are of high enough quality to convert into cropland over the next 20 years. Cotner concluded that the United States is not running out of farmland. In fact, it is possible not only to meet domestic food needs, but also to meet moderate export demands. Nevertheless, there are constraints which may become more important in the future and which may have a significant impact on food production. These constraints include: higher energy costs, restricted water availability, weather and climate, increased costs of nonland inputs, environmental restrictions, a declining rate of advancement of agricultural technology,

⁶Cotner, loc. cit.

the continued conversion of productive farmland to non-agricultural uses, and increases in export demands.

Similar findings were also reported by Miner.⁷ Land in cropland declined steadily during the 1940's and 1950's. However, for every two acres converted from agricultural use, an average of one new acre of cropland was created. Therefore, the total net loss between 1945 and 1964 was 1.4 million acres. At the same time farmland yields were increasing more rapidly than the population. It is anticipated, therefore, that there is enough farmland to fulfill the food requirements of the nation until the year 2000 and probably beyond. As brought out earlier, other variables may alter this projection. According to Miner these factors include: increasing foreign demands for U.S. food exports, energy cost and availability, the ability of farm productivity rates to increase, and the degree to which environmental and other controls restrict farming activities.

Other estimates on the rate of conversion of agricultural land and cropland availability vary greatly. Heady and Timmons⁸ estimated a resource of 264 million acres available for conversion to cropland. This land

⁷Dallas Miner, "Agricultural Preservation: A New Issue in Open Space Consideration," Environmental Comment, October, 1974, pp. 1-2.

⁸Earl O. Heady and John F. Timmons, "U.S. Land Needs for Meeting Food and Fiber Demands," Journal of Soil and Water Conservation, Jan.-Feb., 1975, pp. 15-22.

would be suitable if improved and properly managed. A more recent estimate indicates that there is about 11 million acres of potential cropland.⁹ Reports of conversion rates range from 1.1 million acres annually for the period 1958-1967 to an estimate of 2 million acres annually for 1967-1975¹⁰ to an estimate total loss of 177 million acres between 1950 and 1969.¹¹ These estimates may vary due to differences in definitions or due to interpretation of the data.

Urbanization and Agricultural Land

Urban land uses in the United States occupy approximately 61 million acres. One estimate indicates that the average increase in land in urban uses has been 730,000 acres annually over the past 40 years.¹² Reports on the amount of farmland contributing to this urban growth vary from less than one-half of the acres of new urban uses to 563,000 acres.¹³ Compared to the total number of acres of

⁹Dideriksen and Sampson, loc. cit.

¹⁰Coughlin and others, op. cit., p 18.

¹¹Mark B. Lapping, "Policy Alternatives for the Preservation of Agricultural Land Use," Journal of Environmental Management, Vol. 5, 1977, pp. 275-287.

¹²Economic Research Service, Major Uses of Land in the United States, Summary for 1969, Agricultural Economics Report No. 247 (Washington, D.C.: U.S. Department of Agriculture, 1973).

¹³Miner, loc. cit.; Coughlin and others, loc. cit.

land in this nation (2,264 million acres), urban uses and the growth in urban land uses may seem insignificant. Yet, there are a number of reasons for the concern over the conversion of agricultural land to urban uses.

Agricultural activities cover approximately one-third of the nation's land. Many important urban centers have grown up in agricultural regions. Increasing demands for space by these urban centers have resulted in an "urban threat to rural lands." Urban growth is steadily encroaching on the agricultural land surrounding metropolitan areas. More land is removed from agricultural production than is needed for urban expansion. In addition, agricultural activities, especially crop production, frequently experience indirect effects from urbanization not observed in other land uses.¹⁴

There are a number of critical forces working to expand urban uses into farmland areas. Probably the greatest

¹⁴For a more detailed discussion of the urbanization of farmland, refer to the following: Coughlin, loc. cit.; Raup, loc. cit.; Richard C. Collins, "Agricultural Land Preservation in a Land Use Planning Perspective," Journal of Soil and Water Conservation, Sept.-Oct., 1976, pp. 182-189; Irving Dubov, Ronald D. Weddel, and Brady J. Deaton, "Land Use Planning at the Rural/Urban Fringe," Tennessee Farm and Home Science, Oct., Nov., Dec., 1976, pp. 28-32; Gail Easley, "Agricultural Land Use and Urbanization: Examining the Issues," The Tennessee Planner, Vol. 34, 1978, pp. 9-15; and Dallas Miner, "Agricultural Retention: An Emerging Issue," Environmental Comment, Vol. 21, 1975, p. 1.

impact has resulted from the subsidization of the suburbs. Federal programs have worked to encourage suburban growth and expansion.¹⁵ Provision of public services, such as sewers or schools, has not always been consciously used as a tool to guide the suburban land conversion process. Instead, the provision of these services is often an accomodation to other economic and political forces. Other factors contributing to the urbanization of the rural landscape are rapid population growth within a particular region, the decentralization of population from the metropolitan core, and the revival of growth in nonmetropolitan areas.¹⁶

Not all effects of urbanization are direct. Indirect effects result in changes in the attitude held by farmers towards the future of agriculture. Increases in urban and exurban populations, declines in the political, economic and social status of farmers, spillover effects, and land speculation are forces behind the changes in attitude. These forces combine to produce a localized idling of otherwise productive farmland. Farther from the metropolitan core the pressures of urbanization may be weaker, but still seen as inevitable by the farmer. This may result in a widespread change of types of agricultural activity requiring shorter term investments and/or more rapid returns

¹⁵For example, federally insured mortgages and federal income tax deductions for home owners have lowered the cost of home ownership, and thus increased suburban growth.

¹⁶Easley, loc. cit.

on investment in anticipation of conversion of the farmland. Not all changes in agricultural activities, however, can be attributed to urbanization pressures.¹⁷ Figure 1 depicts forces and constraints leading to changes in farm activities.

Regional, State and Local Perspectives

There is a considerable difference between the national situation with regard to agricultural land losses and the regional or state situation. Considering the entire United States there may be sufficient agricultural land to meet our needs. While urbanization is posing a threat to farmlands on the urban/rural fringe, other croplands are available. The nation is not likely to experience a real threat to food production capabilities. Probably the most compelling reasons for concern over farmland conversion are not in terms of national food production, but are from the state and local perspective of the importance of agriculture.¹⁸

The northeastern United States, for example, has the highest population densities in the country. Between 1960 and 1970 this area experienced the greatest population

¹⁷Coughlin, op. cit., pp. 77-78.

¹⁸Cotner, op. cit., p. 3.

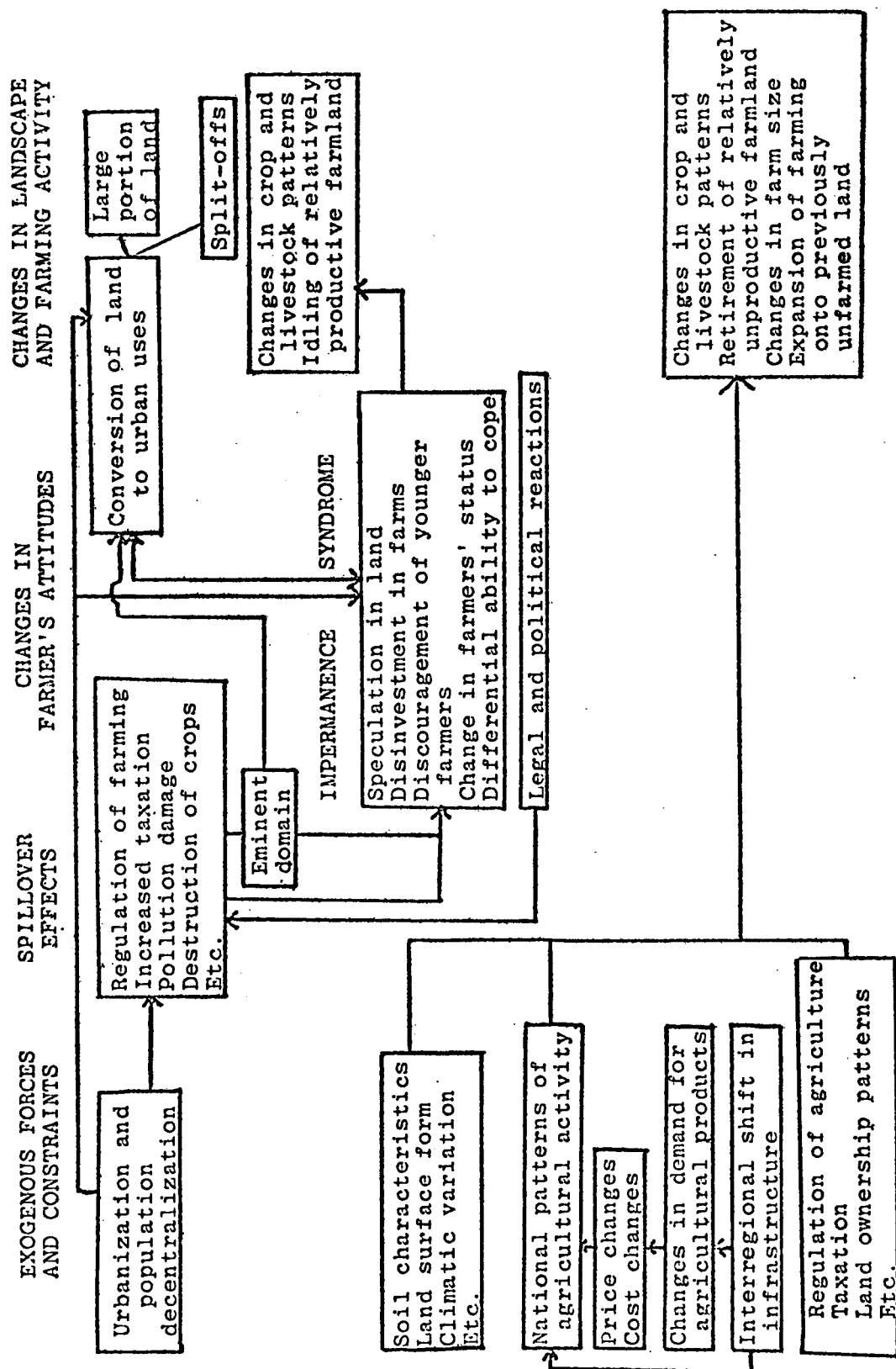


Figure 1. Farmers' Responses to Urbanization in the Context of other Exogenous Forces and Constraints.

Source: Robert E. Coughlin and others, Saving the Garden: The Preservation of Farmland and other Environmentally Valuable Land, (Philadelphia: Regional Science Research Institute, 1977), p. 75.

gain. As a region, this area has some of the highest land values in the nation. Therefore, many states in the northeast are trying to assist agricultural operations and preserve prime farmland. This is being done in an effort to insure the continuance of a viable agricultural industry in the area.¹⁹

The conversion of working farms to urban uses or to pasture instead of cropland may also threaten the existence of farm support businesses in an area. Farming, along with the agricultural supply and processing industries which support farming, may account for sizeable percentages of local employment and income. A great deal of production may be required to sustain this agricultural infrastructure.²⁰ Economies of scale are important in the operation of feed mills, fertilizer plants, supply stores, machinery dealerships, and other firms providing marketing and processing services. Community employment and income may be adversely affected and the remaining farmers may be

¹⁹Miner, loc. cit.

²⁰It should be recognized, however, that urban uses which may occupy agricultural land can generate far more economic activity than would agricultural uses. Saving farmland may be a goal of those who represent agricultural interests, but may not be a goal of those representing other, urban interests. Therefore, it is necessary to consider whose interests are being served and whether generation of economic activity is the only criterion to be met.

without adequate services.²¹

There is a noticeable bias for urban development to take place in areas where the best soils are located, in the Midwest, in lowland parts of the Northeast, and in the valleys of California, for example.²² Lands which are prime for agricultural uses are generally the best lands for urban development. They are usually level, well-drained, and require a lower development cost. Other lands with higher development costs, such as hillsides or timberland, may be desirable for higher priced housing, which is a limited market. The problem of the loss of farmland is alarming in some areas of the country. There are negative impacts where rapid urbanization is occupying once productive agricultural areas. New York's Long Island truck farming, Vermont's dairies, North Dakota's grain, Colorado's pastures, and Florida's orange groves are prime examples.²³

Much of the interest in preserving prime agricultural land is really a concern for "areas of critical local concern." The most drastic examples of such areas are those with specialized soils or climates which are uniquely

²¹B.L. Dillman, "Preservation of Agricultural Land: State and Local Perspectives, Community Values and Policy Implementation," paper presented at the annual meeting of the American Agricultural Economics Association, Blacksburg, Virginia, August, 1978.

²²Coughlin, op. cit., pp. 73-76.

²³Mark B. Lapping, "Planning Strategies for Preserving

suited to the production of certain commodities such as citrus, berries, or truck crops, and which also happen to be areas of concentrated population pressures. Even where commodities could be produced elsewhere, there may be a fear locally that agriculture will be eliminated, resulting in negative impacts as discussed earlier.²⁴

The Public Interest in Preservation

While there are concerns about world food supplies, domestic food prices, and the desirability of having a diversified local economy, this may not be the only purpose, or even the real purpose, in a move to preserve agricultural land. It may be an urban growth issue, concern for open space, recreational opportunities, a desire to exclude low-cost housing, a desire to keep taxes low, or a desire to maintain a rural, small-town atmosphere.²⁵

The public purpose in agricultural land preservation is broad; preservation programs meet a wide variety of objectives. Included in these objectives are energy conservation, prevention of urban sprawl, promotion of compact development, maintaining open space, retaining natural systems, controlling public costs, preserving the economic base, promoting local self-sufficiency, preserving

Agricultural Land Use," paper presented at the 57th Annual Conference of the American Institute of Planners, San Antonio, Texas.

²⁴Dillman, loc. cit.

²⁵Collins, loc. cit.

a rural lifestyle, or maintaining specialty crops.²⁶ The issue in retention of agricultural land may be expressed in terms of a concern for "quality of life." City dwellers are affected by a lack of open space, scatteration, and leap-frog development which hinders the adequate provision of urban services and facilities. In rural areas, residents are concerned over unplanned urban encroachment, the speculative idling of productive agricultural land, the isolation of farming enterprises, high property taxes, and increased land values due to speculation.²⁷

It is, therefore, obvious that there is no single public purpose or public interest to be served. Depending upon the level of government and the location of the area considered for preservation action, different purposes will be served. Policy objectives may range from local concerns for the economy, food supplies, or the control of urban sprawl to more widespread issues of pollution, the state economy, or the retention of productive soils in agriculture.²⁸ The relative importance of these objectives may vary not only at different levels of government but also at different geographic locations. Concerns over retaining

²⁶William Toner, Saving Farms and Farmlands: A Community Guide, PAS Report No. 333 (Chicago: American Society of Planning Officials, 1978), pp. 3-4.

²⁷Miner, loc. cit.

²⁸Anderson and others, loc. cit.

farmland at the local level also emphasize freedom of choice for the farmer, agricultural activity to support the agriculture infrastructure, and the values of farmland for open space, visual quality, and pollution reduction.²⁹

Regardless of the underlying reason for promoting the preservation of agricultural lands, there has been a growing concern for this aspect of land use and land use planning. If policies are to be established to actively preserve agricultural land from conversion to other uses, it is first necessary to identify the goals to be met by such policy. Early legislation enacted by state governments recognized the value of agricultural production to the economy of the state. Preferential tax treatment was available for agricultural land in order to protect the supply of food and farm products and to prevent the early conversion of farmland to other uses due to economic pressures. Since these early efforts by state governments, the issue of agricultural land preservation has received considerable attention, not only from the federal government, but also researchers, farmers, and city-dwellers.

Federal Government Activities

As might be expected, the United States Department of

²⁹Dideriksen and Sampson, loc. cit.

Agriculture (U.S.D.A.) has a major interest in the agricultural land preservation issue. Background papers prepared for a seminar on prime agricultural land for the Committee on Land Use³⁰ indicated no compelling reasons for preserving prime agricultural land. In spite of this finding, a statement published following the seminar noted that the "U.S.D.A. should take a major, defined, and well-promoted role in the national questions of utilization, enhancement, and retention of agricultural lands as an advocate of retaining the maximum possible base for the production of food, fiber, and timber products, and minimizing actions that will diminish the nation's capacity to produce these essential commodities."³¹ Subsequently, the Acting Secretary of U.S.D.A. issued a memorandum on that agency's agricultural land use policy (see Appendix B).³² Specific policies set forth included:

- 1) advocate the protection of prime lands from premature or unnecessary conversion,
- 2) assure the consideration and evaluation of the impact of major Federal actions in environmental impact statement procedures,

³⁰U.S. Department of Agriculture, Committee on Land Use, Perspectives on Prime Lands, (Washington, D.C.: U.S. Department of Agriculture, 1975).

³¹U.S. Department of Agriculture, Committee on Land Use, Recommendations on Prime Lands, Report from the Seminar on the Retention of Prime Lands (Washington, D.C.: U.S. Department of Agriculture, 1975), p. 4.

³²John A. Knebel, Statement on Prime Farmland, Range, and Forestland, Memorandum No. 1827, Supplement 1 (Washington, D.C.: U.S. Department of Agriculture, 1976).

- 3) initiate cooperative efforts with states, local governments and universities to insure concern for food, fiber and wood production in prime land identification, and
- 4) consider local, state and national concerns for prime land retention in U.S.D.A. programs and activities.

Prime agricultural land had been identified earlier as a significant environmental resource in the 1969 National Environmental Policy Act. While that implied a national commitment to develop an effective agricultural land preservation policy, the U.S.D.A. has explicitly stated a commitment to develop a strong policy of farmland retention. Since the issuance of the policy statements discussed above, the U.S.D.A. has gone still further in supporting the idea of retaining prime agricultural land. The Assistant Secretary of Agriculture under President Carter has reestablished the U.S.D.A. Land Use Committee to look at an appropriate mix of tools for preserving prime farmland. In a discussion of the issue, Cutler poses the following question, "How far can we as a nation go in continuing to permit the kidnapping of prime farmland for housing and industrial use without gravely endangering our capacity to meet the food needs of our people and our food commitments to the disadvantaged people of the world?"³³

³³Rupert M. Cutler, "How the Department of Agriculture Views the Land Use Issue," paper presented at meeting of the Soil Conservation Society of America, Washington, D.C.

The State Perspective

The role of the states in agricultural land preservation has both similarities and differences compared to Federal concerns for preservation. The goals and policies expressed at state level are seldom based upon concerns for a diminishing cropland base. State goals and policies are frequently established because of a perceived need to preserve agricultural production as a significant input into the economy, to preserve open space, to protect the ability of the farmer to provide an adequate, local supply of food and farm products, to conserve an important natural resource, to prevent the premature conversion of farmland to other uses due to economic pressures, or to control urban expansion. An underlying assumption is that continued growth following an existing trend will result in an undesirable outcome with regard to open space and agricultural land. It is, therefore, difficult to be certain of the real purposes of the actors in the formulation of a preservation policy. Recent concern with growth policy and growth limits places agricultural land within a triangle of concern for resource conservation, environmental quality, and economic policy.³⁴

Most states do not have explicitly stated goals for

³⁴Collins, loc. cit.

state-wide planning in general or land use planning specifically. Frequently legislation which relates to agricultural lands is in the tax laws, granting differential or preferential treatment to farmlands. This often takes the form of use-value assessment of agricultural land. Restrictive agreements, zoning or districting, and purchase or transfer of development rights are other forms of land use controls legislated by the states to satisfy the goal of preserving agricultural lands. Goals and/or policies are seldom explicit with regard to agricultural land. A few states do have policy or goal statements, as discussed in the following cases.

For example, Hawaii, one of the earliest states to enact state-wide planning, includes a specific policy statement, to "assure the availability of agriculturally suitable lands with adequate water to accommodate present and future needs. . . ." ³⁵ In that state's land use plan it is further stated that "in the establishment of the boundaries of agricultural districts the greatest possible protection shall be given to those lands with a high capability for intensive cultivation. . . ." ³⁶

³⁵State of Hawaii, Revised Statutes, Section 205-2; 1975.

³⁶Ibid.

In Oregon there is a set of Statewide Planning Goals in the Comprehensive Plan. Goal #3, Agricultural Lands, states that ". . . agricultural lands shall be preserved and maintained for farm use, consistent with existing and future needs for agricultural products, forest and open space. . . ." ³⁷ Based upon this goal the agricultural land use policy provides special protection for Oregon's agricultural land because it is the non-replaceable foundation for crops and livestock. Specifically, the legislation states that open space in agricultural use is an efficient means to conserve natural resources representing an important physical, social, aesthetic, and economic asset; that preserving agricultural land conserves state economic resources, maintains the agricultural economy, and assures adequate food; and that urban expansion causes unnecessary increases in the cost of community services, conflicts between farm and urban activities, and a loss of open space around urban centers. ³⁸

The state of Maryland has always put a high value on its agricultural land. It was the first state to implement use-value assessment of agricultural land. The preservation of agricultural land is recognized as a critical planning issue, resulting in strong legislation.

³⁷State of Oregon, Comprehensive Plan, 1973, p. 2.

³⁸State of Oregon, Agricultural Land Use Policy, Oregon Revised Statutes, Section 215.243, 1973.

The most recent legislation, enacted to provide for the purchase of development easements, had the stated purpose of preserving productive agricultural land which provided for the continued production of food and fiber, curbing urban sprawl, and protecting agricultural land as open space land.³⁹

Farming is the largest single industry in New York state. Therefore, it is recognized in the State Land Use Plan that future needs of the state require the preservation of viable farmland for both food production and the retention of valuable open space. Farmland location is important since it can contribute to the containment of urban growth. It is State policy to implement programs to ensure proper management of significant state resources such as agricultural and forest lands. Specific objectives to meet these goals are: "to encourage agriculture and discourage the losses of farmland to non-farm uses; and to preserve the state's unique and irreplaceable farmland. . . ."⁴⁰

The State of Illinois has prepared a series of comprehensive growth and resource conservation policies, one dealing specifically with agricultural resources. One

³⁹State of Maryland, Revised Statutes, Title 2, Subtitle 5, Sections 2-501 through 2-515, 1977.

⁴⁰Division of State Planning, New York State, Comprehensive Planning Assistance Program, State Land Use Element, 1978, p. 2.

stated goal is the preservation of agricultural land. Among the policies formulated to achieve this goal are to ". . . reduce the pressures to sell farmland for non-farm use. . . ." and to ". . . reduce to a minimum, the conversion of farmland. . . ." ⁴¹ In Maine the Farm and Open Space Tax Law was passed by the legislature in order ". . . to maintain a readily available source of food and farm products and to prevent the forced conversion of farmland to other uses. . . ." ⁴² In the policy plan for South Dakota it is recommended that minimization of urban conversion of the best farmland should be a state goal. ⁴³ In Virginia it is explicit State policy to conserve, protect, and encourage the development and improvement of agricultural and forest lands for the production of food and other products. It is also state policy to conserve and protect agricultural and forest lands as valued natural resources. ⁴⁴

It is not only legislative intent that shapes the

⁴¹Department of Local Government Affairs, State of Illinois, Growth and Resource Conservation Policies in Illinois: Agricultural Resources, Physical Resource Management Series, 1978, pp. iv-vi.

⁴²Rich Rothe, The Farm and Open Space Tax Law: A Brief Analysis (Albany: Maine State Planning Office, 1978).

⁴³George Morse, Alternative Policies for Preserving Lands for Agricultural Use, EC713, (Brookings: South Dakota State University, 1976), pp. 2-3.

⁴⁴State of Virginia, Code of Virginia, Agricultural and Forestal District Act, Chapter 36, Title 15.1, 1977.

laws passed to preserve and protect agricultural land. Citizens as well as government officials believe that the preservation of remaining agricultural lands is in the public interest.⁴⁵ In Montana a survey was conducted of county commissioners, conservation district supervisors, city, county, and area planning board members to learn their opinions on land use issues. The most frequently cited problem was the need for "Preservation of the economic base represented by prime agricultural and forest lands." In a similar statewide poll of citizens, two-thirds of the respondents favored the preservation of Montana lands for food production, rather than using it for residential or recreational purposes.⁴⁶

The Local Perspective

There is little detailed information on agricultural land preservation activities at local or substate levels. However, available information seems to indicate that local government concern is based upon objectives of growth control or the control of urban expansion. This concern may also be based upon a perceived need to preserve agriculture as an economic activity.

⁴⁵Scott Lefaver, "A New Framework for Rural Planning," Urban Land, Vol. 37, 1978, pp. 7-13.

⁴⁶Harold A. Fryslie, Personal Communications, Montana legislature, 1978.

Local government options in land use control are often determined by the state. State enabling legislation is usually necessary for local government action. Concerns expressed at the state level are often not only a reflection of state-wide needs but also a reflection of local needs. State policy should not only provide for meeting state-wide needs, but should also provide legislative flexibility for local governments to exercise a variety of options adapted to local circumstances. It is useful, therefore, to combine the discussion of state and local agricultural land use activity, as is done throughout this thesis.

Conclusion

The available evidence indicates that, while agricultural land is certainly undergoing continued conversion to other uses, it is not likely that this conversion represents a serious threat to our ability to produce food and fiber to meet national needs. In spite of this, there is a real concern about the quality and location of agricultural land, especially cropland. As cropland is converted to urban or other built-up uses, other cropland is brought into use. This "new" cropland may result from irrigation, new farming techniques, or from putting idle lands back into use. It is not clear whether this reclaimed cropland is marginal or prime land. Additional data is required to make that determination.

Even though there appears to be an adequate cropland

base to meet national needs, and even to meet moderate export demands, there are factors or constraints which could quickly and seriously alter the present situation. Such factors include the increasing cost and uncertain availability of energy, possibly restricted availability of water, changing climatic and weather conditions, environmental restrictions (especially with regard to the farm use of chemicals such as fertilizers or pesticides), a declining rate of advancement in developing new agricultural technology, the continued conversion of productive and prime farmlands to non-agricultural uses, and increases in export demands. Sound land management practices are necessary not only to insure that the present cropland base can meet our needs for the next 20 years, but also to insure the greatest productivity from reclaimed cropland.

The goals and objectives of agricultural land preservation efforts differ markedly at national and state/local levels of government. National concerns are concentrated upon the continued production of food and fiber to meet domestic needs. In addition, agricultural exports are a major source of foreign exchange; therefore, the preservation capacity may be a critical variable in the achievement of a healthy balance of trade.⁴⁷ The federal agency

⁴⁷Raup, loc. cit.

with primary concern for an agricultural land policy is the U.S.D.A. This agency has issued strong policy statements concerning the national goal of preserving agricultural lands, especially prime agricultural lands.

At the state level other issues often provide the incentive for agricultural land preservation efforts. It has been argued that the consideration of agricultural land in general and prime agricultural land in particular is long overdue in formulating urban policy.⁴⁸ Such consideration should be an integral part of the growing number of growth policies. Since many urban centers have grown up serving the agricultural regions forming their hinterland, urban sprawl and expansion frequently account for "lost" agricultural land. Farmland is attractive to the suburban developer because it is often level, well-drained, and available in a single, large block from one owner. These attributes result in lower preparation costs to the developer. This same fact also results in a higher market value of the land and has led to a number of differential taxing laws in several states. Such laws usually are passed in recognition of the significant contribution of agriculture to the economy of the state. The intent, then, is twofold--to preserve the agricultural

⁴⁸Collins, loc. cit.

production capacity as a valuable and viable input to the state's economy and to place some measure of control on costly urban sprawl.

Other objectives have been suggested as motives for legislative attempts to preserve farmland in the states. Such objectives might be to preserve open space in the form of farmland, to protect the ability of the farmer to provide an adequate, local supply of food and farm products or to conserve an important natural resource with visual and aesthetic attributes. Agricultural land may represent an important physical, social, aesthetic or economic asset. Farming is not only a way of life for the farmer and his family. The farm is only one enterprise in the large agricultural infrastructure in the community. Agricultural supply and processing industries supporting farming may account for sizeable percentages of local employment and income. Because of the multiplier effect of the farming enterprise, its loss could have a significant negative impact on the entire community.

Thus, it is clear that the "need" to preserve agricultural land is dependent upon a number of factors. Preservation strategies may not be justified based upon rates of conversion of agricultural land or number of acres lost to farming. There may be a real need, however, based upon issues of urban sprawl, leap-frog development, the contribution of farming to the local/state economy,

the desire for open space near the city along with the visual, aesthetic enhancement of the landscape provided by farms, or as a part of a sound, long-range planning program for the area.

CHAPTER III

STRATEGIES OF AGRICULTURAL LAND PRESERVATION

In 1956 Maryland was the first state to enact legislation specifically designed to retain agricultural land in use for agricultural purposes. Since that time a majority of the states (46 in 1979) have attempted, through a variety of techniques, to preserve agricultural land. These early efforts generally provided for preferential tax treatment of agricultural land when used for agricultural purposes. These programs afforded some measure of tax relief to the farmer. However, there has been little change in the spread of urban and suburban uses to farmland.¹ Other programs have been implemented in the continuing effort to preserve farmland. These measures include such things as agricultural zoning or districting, the purchase or transfer of development rights or development easements, property acquisition and the use of restrictive covenants or restrictive agreements.

The subject of the preservation of agricultural land has been receiving a great deal of attention at national, state, and local levels. There is a real need to determine which programs or combinations of programs can be effective

¹Linda K. Lee, A Perspective on Cropland Availability, AER 406 (Washington, D.C.: U.S. Department of Agriculture, 1978), pp. 16-17.

in an area or an entire state. Past programs have met with varying degrees of success. This chapter examines the various types of preservation programs, including a discussion of the advantages and disadvantages of programs currently in use or proposed for the preservation of farmland. The first section deals with preservation strategies and some important advantages and disadvantages of these techniques. The second section is a summary of state programs.

Preservation Strategies

Strategies for the preservation of agricultural land may be grouped under three main types of approaches: development rights, regulation, and tax policies. Table 4 is a summary of these approaches to agricultural land preservation. There is a brief general description and comments on some typical variations in the programs. A more detailed discussion follows.

Development Rights. A government can affect the development of property through use of the police power, through eminent domain, or through voluntary transactions^{2,3} with the owner. There must be a substantial public benefit

²Leslie Small and Donn A. Derr, "Controlling Development Rights: The Alternatives," Journal of Soil and Water Conservation, Sept.-Oct., 1976, pp. 190-194.

³Mark B. Lapping, "Policy Alternatives for the Preservation of Agricultural Land Use," Journal of Environmental Management, Vol. 5, 1977, pp. 275-287.

TABLE 4. Summary of Land Use Controls for the Preservation of Agricultural Lands

Type	General Description	Typical Variations
1. Direct purchase of development rights (easement)	A development rights easement is purchased. Owner is paid the difference between market value and value based on permitted uses. Owner surrenders the right to develop.	Can be either mandatory or voluntary. May require minimum percentage of land being available.
2. Transfer of development rights.	Developers in growth zones may acquire development rights from landowners in no-growth zone.	Values may be determined by market or by government; May be restricted by location.
3. Purchase and resale with restrictions.	Purchase is at market value. Use restrictions are attached to deed and property is sold.	Can be either mandatory or voluntary. Resale prices set by market or administrative formula.
4. Purchase and lease with restrictions.	Same as 2, except property is leased rather than sold.	Same as 2, except property is leased rather than sold.
5. Preemption	Owner must inform government of intent to sell. Government has first refusal. Government can then buy and resell or lease with restrictions.	

TABLE 4. (continued)

Type	General Description	Typical Variations
6. Exclusive farm zoning.	Forbids development incompatible with farming in farm zoning.	Large lot zoning, density, performance, quarter/quarter, sliding scale.
7. Exclusive agricultural districts.	Limitations on power of local government to regulate farming practices, utilities to impose assessments, state or local government to locate urban infrastructure.	May include various combinations of specific limitations.
8. Inverse condemnation.	Government imposes regulation on use of land. Owner may claim compensation based on taking issue within a time limit.	
9. Permit system	Certain types of development in specific areas must have a permit.	May be subject to certain conditions. May be at local, state or regional level.
10. Differential assessment for property tax.	Eligible land is assessed at use value rather than at market value.	May be pure preferential assessment, or deferred taxation with some form of penalty tax for converting land. May include restrictive agreement for a number of years. Some features of the program may be voluntary.

TABLE 4. (continued)

Type	General Description	Typical Variations
11. Differential valuation for federal estate and state inheritance taxes.	Eligible land is assessed at use value rather than at market value.	May require a minimum number of years in farming.
12. Capital gain tax.	High capital gains tax for short term land holders. Usually decreases rapidly over time.	
13. Establishment of Farmcolony.	Agricultural land is retained in active agricultural production. Marginal land is developed for residential use, with new residents purchasing equal portions of working farms.	May include various combinations of criteria for selection and operation. May be zoned as P.U.D.

Source: Adapted from Robert E. Coughlin and others, Saving the Garden: The Preservation of Farmland and other Environmentally Valuable Land, (Philadelphia: Regional Science Research Institute, 1977), pp. 115-116.

in terms of health, safety or general welfare to exercise the power of eminent domain or the police power. The use of the police power is probably inappropriate for the preservation of agricultural land, except for enforcing zoning regulations. The use of eminent domain must also demonstrate public purpose, even though just compensation is paid for the property. The use of eminent domain to acquire development rights would allow farmers to continue to own and farm their land without interference. Compensation would be paid for the decrease in value due to loss of the right to develop.⁴

Public purchase of development rights can directly protect farmland. The purchase of development rights may be through the exercise of eminent domain or a voluntary transaction. (Voluntary transactions between government and individual property owners may be more politically acceptable.) Such purchase removes the right to develop specific parcels of land and compensates the owner for the decrease in market value of the land resulting from restrictions. These development rights, often referred to as easements, could also be classified as scenic, open space, or conservation easements.⁵ Purchases of easements and development rights

⁴Ibid., p. 28.

⁵Robert E. Coughlin and others, Saving the Garden: The Preservation of Farmland and Other Environmentally Valuable Land (Philadelphia: Regional Science Research Institute, 1977), pp. 114-117.

may require the outlay of large sums of public funds. In some instances such purchases may be as expensive as buying the land.⁶

Such programs serve to distribute costs to the people benefitted (the public). In addition, the farmer retains his lifestyle, agricultural production is continued, and the payment can reduce the indebtedness of the farmer. However, some disadvantages have been identified. In addition to the possible high cost of public acquisition of development rights or easements, remaining land may rise in value and further increase program cost. If this type of program is not implemented on a regional scale, it may result in leap-frog development.⁷ Such leap-frogging adds to the undesirable land use pattern rather than working to improve the situation.

Transfer of Development Rights. Rather than public acquisition of development rights, the development rights, severed from the land, may be sold or transferred on the open market. Such programs may be less costly to the public. Compensation, in this case, comes from developers rather

⁶Richard C. Collins, "Agricultural Land Preservation in a Land Use Planning Perspective," Journal of Soil and Water Conservation, Sept.-Oct., 1976, pp. 182-189.

⁷John Dawson and others, Farmland Preservation Methods, Report of the Committee on Farmland Preservation to the Maine Food and Farmland Study Commission, (unpaged, no date).

than the government. The Transfer of Development Rights (TDR) combines the concept of zoning with compensation to owners of restricted lands. While the TDR may have many forms, there are two basic components. First, environmentally valuable land (i.e., farmland) within the planning jurisdiction is zoned for little or no further development (no-growth zone). Second, there must be some inducement for transferring development rights from a no-growth zone. Development rights are separated from land in no-growth zone and made available for purchase and attachment to land in the growth zone.

A real advantage in the use of TDR is that the market can function more freely, thus allowing more flexibility. In addition, farmers who wish to remain in farming can sell the development value of their land and continue to farm as in the past. However, it should be noted that there are important disadvantages. It is very difficult to balance the supply and demand for development rights (there must be a strong demand for development rights, as well). In addition, it may be administratively complex. At the local level a TDR program can result in leap-frog development.⁸ However, it can only work within a political jurisdiction, making it difficult or impossible to implement

⁸Dawson, loc. cit.

on a regional basis. Thus far, use of TDR has not been a significant factor in preserving open space or agricultural land.⁹

Direct Land Acquisition. Other means of preserving agricultural land involve direct purchase of the land. The land is then sold or leased back to the farmer after imposing use restrictions, either in the deed, or the lease agreement. The net result of some actions is also to separate the development rights from the land.¹⁰ In addition, special lease arrangements could insure that the farmer apply whatever management practices he chooses, without government interference. A major problem with this method, as in other methods involving public purchase of development rights, is the large commitment of public funds.¹¹

Preemption. Another method of acquiring the development rights to a parcel of land is through the exercise of the right of preemption. This also requires direct purchase of the land which can then be sold or leased after imposing use restrictions. Under this method the

⁹Collins, loc. cit.

¹⁰Coughlin, op. cit., pp. 118-119.

¹¹Dawson, loc. cit., Lapping, loc. cit.

owner must inform the government of the intent to sell. The government has the right of first refusal, and can then buy and resell or lease the land. Since only those properties actually available in the market would be purchased with public funds, total cost could be less than for other direct purchase programs. In addition, the purchases would likely be spread over a greater time period, rather than occurring at the beginning of the program. Such a program is not currently in use in the United States. It is, however, compatible with the American legal system.¹²

Zoning Regulations. The power to regulate is based on the police power. Literally thousands of governing bodies have the power to regulate land use. Combining planning with regulation can aid in the selection of an effective regulation for the preservation of farms and farmlands. Probably the most widely used regulation of land use is some form of zoning. Zoning is a land use management technique familiar to many local governments. However, local zoning ordinances are often of limited use as a means of preserving agricultural land. Therefore, many local governments have implemented an exclusive farm or rural use zone which is much restrictive.¹³ Such

¹²Coughlin, op. cit., p. 120.

¹³This may or may not be a separate ordinance.

exclusive zoning allows only the type of use specified, or uses directly related to the major use. This type of zoning may be more effective in resisting urbanization pressures than other types of zoning. Typical characteristics of exclusive farm zoning are large minimum lot sizes and a very limited number of permitted uses. Permitted uses are usually farms and farm-related dwellings with non-agricultural uses specifically prohibited.¹⁴

There are a number of variations to conventional zoning. These include quarter/quarter zoning, cluster zoning, and large lot zoning. The quarter/quarter zoning technique is a variation of a 40 acre minimum lot size.¹⁵ In quarter/quarter zoning each landowner is entitled to one residential lot for each 40 acres of farmland. A major objective of this approach is to encourage use of the least productive land for development. It thus represents a compromise between agricultural preservation objectives and the desire of farmers and landowners to enjoy some speculative gain. Agriculture is maintained as a permanent

¹⁴Wasatch Front Regional Council, op. cit., pp. 33-36; Gregory Lyman and others, "Can Zoning Preserve Farmland?" Practicing Planner, Sept. 1977, pp. 18-30.

¹⁵A quarter/quarter section is 1/16 of a section (square mile) of land, or about 40 acres. However, a quarter/quarter section is an exact measure, based on a government survey, and does not always contain 40 acres.

use rather than a transitional use. Farmers are also able to retain some flexibility and control over the use of their land. Finally, quarter/quarter zoning is inexpensive to develop and easy to administer. However, this type of zoning is best suited to rural areas with moderate growth pressure and with large parcels owned by a limited number of individuals.¹⁶

Sliding scale zoning allows a certain number of lots based on the size of the entire parcel. The permitted density varies inversely with the parcel size. Use of this zoning technique encourages the retention of larger farms while exerting less restraint on smaller holdings which may be less critical to the future of the agricultural base. Sliding scale zoning requires continuous monitoring of the development allotments but is relatively easy to administer. It offers protection to farmland while maintaining enough flexibility to allow some expansion at the periphery of the urban area.¹⁷

Performance zoning sets specific standards which must be met in order to qualify for location in a particular zone. Applying performance standard zoning to agricultural land for purposes of preservation could take two approaches. The first would be to insure that urban development occurs

¹⁶ William Toner, Saving Farms and Farmlands: A Community Guide, Planning Advisory Service Report No. 333 (Chicago: American Society of Planning Officials, 1978), pp. 12-15.

¹⁷ Toner, op. cit., pp. 15-19.

close to or contiguous with existing urban areas. Performance standards would thus relate to availability of urban services as well as environmental constraints. With this type of increased control over urban expansion, growth can be directed to marginal land as a means of preserving good agricultural land. The second approach would be to influence agricultural landowners concerning the conversion of all or portions of their farms to non-farm uses. In this instance performance standards would be based primarily upon soil capability classes or upon land which cannot be productively farmed for other reasons (for example, steep slopes, even where land is Class I soil).¹⁸

Two other zoning techniques may be used in agricultural land preservation programs. Large lot zoning is perhaps the oldest and most common. Care must be taken that this regulation be based upon reasonable criteria in the determination of minimum lot size. Parcel size should be related to successful farming practices in the area and should, therefore, reflect the economics of agricultural production. Cluster zoning allows greater flexibility in that residential uses could be clustered so long as overall density limits are not exceeded. Such zoning does not require a specific minimum lot size. Both cluster and large lot

¹⁸Wasatch Front Regional Council, op. cit., pp. 40-41.

zoning can preserve the rural character of an area as well as allowing the continuation of agricultural activities.

Permit System. Another form of regulation is the establishment of a permit system. Here specific types of development must have a permit in addition to meeting other requirements, such as zoning or a building permit. Use of a permit system allows prior assessment of the impact of a proposed development on an area.

Exclusive Agricultural Districts. Finally, exclusive agricultural districts may be established. These provide for a combination of measures to allow the continuation of farming in the district. An important feature of an agricultural districting program is that it is locally initiated and allows for local control with significant participation from the agricultural community.¹⁹ Measures included in such a program may include limitations on local government powers to regulate farming practices which may be offensive (i.e., odors), limitations on state and local governments in the location of roads or urban infrastructure in or near the district, or limitations to the power of utilities to assess farmers in the district on a front-foot basis for utility lines through, or fronting their

¹⁹ Mark Lapping, "Planning Strategies for Preserving Agricultural Land Use," paper presented at the 57th Annual Conference of the American Institute of Planners, San Antonio, Texas, 1976.

property.²⁰

Important advantages of the exclusive agricultural districting concept are the preservation and development of the agricultural community, promotion of retention of large blocks of agricultural land, and ease of administration. Maintaining agriculture as a permanent use also encourages capital investment. It may, however, work to reduce the tax base.²¹

Tax policies. Clearly, the largest category of methods used in an attempt to preserve farmland is property tax manipulations. Probably the most popular program is use-value assessment of agricultural land, generally called differential assessment. Under such a program, farmland is valued according to its current use for agricultural purposes rather than its market value in some other potential uses. The rationale for this type of program is that farmers face inequitable economic pressures in farming their land.²²

Reducing the tax burden, therefore, should alleviate

²⁰ Coughlin, op. cit., p. 135.

²¹ H.E. Conklin and W.R. Bryant, "Agricultural Districts: A Compromise Approach to Agricultural Preservation," American Journal of Agricultural Economics, Vol. 56, 1974, pp. 607-613.

²² The market value, and consequently the tax, for agricultural land is often higher than if assessment were based upon agricultural use. Because many farming activities require substantial land holdings, the tax burden to the

the pressure to convert the land to a more profitable use. A program of tax relief allows the farmer to resist selling his land or converting it to a non-agricultural use because his tax is based on actual use rather than speculative values. Differential assessment, therefore, serves two purposes. The property tax burden of the farmer is likely to be nearer that paid by other property owners. With the use of differential assessment the percentage of personal income which the farmer must pay for property tax should approach that incurred by non-farm landowners.²³ Second, use of differential assessment of agricultural land could influence the pace and direction of development, resulting in the preservation of non-farmland open space as well as farmland.

There are tax laws providing for the differential assessment of farmland in 46 states. Three types of differential assessment are found: preferential assessment, deferred taxation, and restrictive agreements. Some states have more than one differential assessment law, although most have only one. A summary of the tax programs found in the various states is shown in Table 5.

farmer is generally greater than for other activities with a similar net income.

²³Mark Lapping and others, "Differential Assessment and other Techniques to Preserve Missouri's Farmlands," Missouri Law Review, Vol. 42, 1977, pp. 369-408.

TABLE 5. State Differential Assessment for Property Tax

State	Pure Preferential Assessment	Deferred Taxation	Restrictive Agreements
Alaska		x	x
Arizona	x		
Arkansas	x		
California			x
Colorado	x		
Connecticut		x	
Delaware	x		
Florida	x		x
Hawaii		x	
Idaho	x		
Illinois		x	
Indiana	x		
Iowa	x		
Kentucky		x	
Louisiana		x	
Maine		x	x
Maryland		x	
Massachusetts		x	
Michigan			x
Minnesota		x	
Missouri	x		
Montana		x	
Nebraska		x	
Nevada		x	
New Hampshire		x	x
New Jersey		x	
New Mexico	x		
New York		x	
North Carolina		x	
North Dakota	x		
Ohio		x	
Oklahoma	x		
Oregon		x	
Pennsylvania		x	
Rhode Island		x	
South Carolina		x	
South Dakota	x		
Tennessee		x	
Texas		x	
Utah		x	
Vermont	x		x

TABLE 5. (continued)

State	Pure Preferential Assessment	Deferred Taxation	Restrictive Agreements
Virginia		x	
Washington		x	x
West Virginia	x		
Wisconsin			x
Wyoming	x		

Source: Updated from work reported by John C. Keene and others, Untaxing Open Space (Washington, D.C.: Regional Science Research Institute for the Council on Environmental Quality, 1976).

Under a preferential assessment program land in agricultural use is assessed on the basis of its value in that use. There is no penalty imposed if the owner converts the property to a non-farm use.²⁴ Under the deferred taxation approach, farmland is also assessed based on its value in that use. However, should the owner convert the land to a use which does not qualify under the terms of the law, a deferred or rollback tax is levied.²⁵ The deferred tax is usually based on the difference between the use-value assessment and a market-value assessment of the land. This deferred tax provision removes some of the financial incentive for an individual who expects to convert his land in the near future to apply for differential assessment.²⁶ Finally, restrictive agreements may be entered into between landowners and state or local government. The landowner agrees to restrict the use of his land for a specified number of years in return for certain concessions. Penalties may be imposed for early conversion of the land.²⁷

²⁴ Thomas F. Hady and Ann G. Sibold, State Program for the Differential Assessment of Farm and Open Space Land, Agricultural Economics Report No. 256 (Washington, D.C.: U.S. Department of Agriculture, 1974).

²⁵ Ibid.

²⁶ Ibid.

²⁷ Thomas F. Hady, "Differential Assessment of Open Space and Farmland," paper presented at the annual meeting of the International Association of Assessing Officers, Miami, Florida, Nov. 1, 1973.

If the intent of the differential assessment laws is to discourage the conversion of farmland for purposes of urban development, a major problem is to distinguish between the bona fide farmer and the speculator.²⁸ For this reason most differential assessment programs contain provisions which govern the eligibility of farmland. Eligibility criteria usually include such provisions as: minimum farm acreage; a minimum proportion of landowner's income derived from the farming activity; family-owned farms rather than corporate; specified management practices; or certain zoning.²⁹ It has been suggested that differential assessment laws need to be coupled with strong regional zoning plans. The reason for this is that if "tax benefits are available near urban areas, they will reduce availability of land, and encourage 'leap-frogging'."³⁰

There are some advantages to the various differential taxing programs. They do work to shift the tax burden from the farmer. Such programs are often politically popular and relatively easy to administer. There is, however, some loss in total tax revenues. Some voluntary programs

²⁹Glen W. Atkinson, "The Effectiveness of Differential Assessment of Agricultural and Open Space Land," American Journal of Economics and Sociology, April, 1977, pp. 197-204.

³⁰Hady and Sibold, loc. cit.

³¹Atkinson, op. cit., p. 199.

lack participation where farmers may wish to convert their land and relocate farther from the urban center. Certainly, there are difficulties in determining eligible lands and establishing fair valuations.³¹ Finally, it is generally accepted that these tax programs are not effective as methods of land use control.³² The Regional Science Research Institute has had a major role in evaluating the effectiveness of differential assessment. In a detailed study published in 1976, it was concluded that:

With respect to the goal of retarding the conversion of farm and other open land, differential assessment is marginally effective and its cost in terms of tax expenditures is high, in most cases so high as to render it an undesirable tool for achieving this goal. It has its principal effect on the supply of land which is put on the market by reducing the farmer's costs of production and thus increasing the profitability of farming. It has no effect on the decision to sell for non-economic reasons, such as retirement or death. It also has no effect on the major component of the demand for conversion of land--accessibility to growing urban centers. It may even cause effective demand to increase, since developers will be willing to bid more for land, realizing that as long as they keep it in approved use, their carrying costs will be lower.

³¹Dawson, loc. cit.

³²The overall lack of effectiveness of tax programs in land use control and specifically agricultural land preservation has been widely discussed in the literature. For more detailed discussions refer to Atkinson, loc. cit.; Hady, loc. cit.; Lapping and others, loc. cit.; and John C. Keene and others, Untaxing Open Space, (Washington, D.C.: Regional Science Research Institute for the Council on Environmental Quality, 1976).

Thus, except in certain circumstances, we conclude that differential assessment is not very effective in maintaining current use in urban areas, even in the short run. In the long run, death and retirement will bring almost all properties on the open market, and, as a rule, the demand for land for urban uses will increase. In this longer run perspective differential assessment is of little significance in maintaining farm or other open uses. . . . Furthermore, we find that even if the marginal effectiveness of differential assessment were considered to be sufficient as a short-term holding action, its expense in tax expenditures is so high as to render it an inefficient means for achieving such retardation of land conversion as it does.³³

Another study, published in 1977, also concluded that use-value assessment programs, regardless of type, have not proved to be fully effective methods to preserve agricultural land. Several reasons are suggested. First, landowners near urban centers, who are most susceptible to development pressures, have been unwilling to participate in programs with significant conversion penalties. Second, tax concessions may be over-shadowed by development opportunities. Penalties imposed may be small relative to the potential gain. Finally, high quality farmland is usually assessed at higher use values than poor land. This often results in conversion of the better land, which is often closer to the market value, and therefore

³³Keene and others, op. cit., p. 401.

has a smaller penalty upon conversion.³⁴

Another form of tax policy which may be important in agricultural land preservation is the preferential application of inheritance taxes. Because farm estates are quite often large, due to the capital intensive nature of modern agriculture, farmers are particularly affected by inheritance taxes. The burden of inheritance taxes on the heirs often causes family farms and other farms to be sold or broken up into smaller parcels.³⁵ Much of the farmer's capital is tied up in land holdings whose value contributes significantly to estate and inheritance taxes. Where this land is experiencing urban development pressures the market value increases disproportionately to the economic value of the agricultural activity. It logically follows that estate and inheritance taxes are also inflated. As a means of reducing this tax burden, the Federal government passed a Tax Reform Act in 1976 which included provisions to encourage preservation of the family farm following the owner's death.³⁶

Finally, a capital gains tax on land sales may be

³⁴Lapping and others, loc. cit.

³⁵Wasatch Front Regional Council, op. cit., p. 46.

³⁶A general description and discussion of the Federal Estate Tax and the 1976 Tax Reform Act provisions can be found in Coughlin, op. cit., pp. 129-132.

used to discourage land speculation. The tax rate is usually very high for the short term land holder. However, the tax usually declines over the longer term and may have little effect on the long-term investor. Presently, Vermont is the only state to use this tax.³⁷

Farmcolony. A concept which gives the private sector an alternative to aid in the conservation of farmland is the farmcolony. This concept combines residential development with agricultural land retention and allows the residents to be associated with a working farm. The owners enjoy the farm and its amenities while being relieved of the disadvantages of daily farm operations. The surrounding county benefits from the addition to the tax base, while agricultural land is preserved through private development.³⁸

Effectiveness of Preservation Strategies

There are a number of characteristics of the land use controls discussed herein which are important determinants of the overall effectiveness of any program in actually preserving agricultural land. Table 6 is a summary of

³⁷Coughlin, op. cit., pp. 132, 247.

³⁸Joseph H. Nash, Jr., "Farmcolony: A Development Alternative to Loss of Agricultural Land," Urban Land, February, 1976, pp. 12-16.

TABLE 6. Characteristics of Land Use Controls for the Preservation of Agricultural Land as Related to Effectiveness

Program	Degree of Permanency	Public		Coverage	Equity	Prevents		Private Costs	Participation
		Cost	Cost			Unwanted Change	Change		
1. Purchase of development rights	High	Varies. High in areas of high demand.	High	Covers all agricultural land.	Full compensation to land owners.	Yes		None	May be limited by low budget.
2. Transfer of development rights	High	Low		"	"	Yes		None	Depends on market for TDR's.
3. Purchase and resale with restrictions	High	Low		"	"	Yes		New owners pay market price.	May be limited by low budget.
4. Purchase and lease with restrictions	High	Moderate		"	"	Yes		Lesser pays market rate.	"
5. Pre-emption	High	Moderate		Only land coming on the market is eligible.	"	Yes		None	May be limited if many properties become available simultaneously.
6. Exclusive farm zoning	Low	Low		May cover all agricultural land; subject to same pressures for change as other zoning.	No consumption to landowner.	Yes		Owner bears all costs of lost value.	May be limited by political feasibility.

TABLE 6. (continued)

Program	Degree of Permanency	Public Cost	Coverage	Equity	Prevents		Private Costs	Participation
					Unwanted	Change		
7. Exclusive agricultural districts	High	Low	Limited	N/A	Short-term		Require considerable effort to participate.	May be limited in fringe areas.
8. Inverse condemnation	High	Varies; court awards may be high.	"	Owner may suffer loss of value.	Yes		Owner may or may not be compensated.	May be limited by political feasibility.
9. Permit system	Low	Low	Covers all land within designated area.	No consumption to landowner.	Yes		Owner bears cost of lost development area.	All land is designated area.
10. Differential assessment for property tax.	Moderate	Varies; lost tax revenues.	Limited to land meeting certain criteria.	Shifts tax burden from farmers to other taxpayers.	No		Tax costs to non-farm community.	Widespread. Expect restrictive agreement which may be somewhat limited
11. Differential valuation for estate and inheritance taxes.	Moderate	Varies; lost tax revenues.	Covers all agricultural land.	"	Not Always		"	Widespread.

TABLE 6. (continued)

Program	Degree of Permanency	Public Cost	Coverage	Equity	Prevents Unwanted Change	Private Costs	Participation
12. Capital gains tax	Moderate	Low	Cover all agri- cultural land.	N/A	Short-term	Owner bears cost for conversion.	Widespread.
13. Establish- ment of ¹ farmcolony	High	Low	N/A	N/A	Yes	New owners bear all costs.	N/A

¹Since this is a private sector development many characteristics do not apply.

these characteristics as they pertain to the programs presented earlier. It appears that direct controls such as the purchase of development rights are potentially more effective in preserving farmland, especially in areas subject to strong urban pressures. Other controls, such as tax programs, may be effective in areas subject to weak urban pressures. Such programs may serve to strengthen the viability of farming as an economic activity, but can do little to make farming more attractive than urban development. However, a number of factors must be considered in evaluating and selecting a land use control strategy. These include development pressures, the quality of the land for agricultural uses, political considerations, and the degree of public commitment to preserving both agricultural land and agricultural production.

State Preservation Programs

In addition to legislation providing for some form of differential assessment as shown in Table 5, there are other laws or planning activities by state governments which relate to agricultural land preservation. Besides existing legislation, many states are proposing new laws with stricter provisions for the preservation of agricultural land. Agricultural land is being recognized as a significant element in state planning policy and in state land use planning documents. Table 7 is a summary of the types of agricultural land preservation programs presently in

TABLE 7. A Summary of Existing Agricultural Land Preservation Programs

State	Differential Assessment	Agricultural Land Zoning ²	Agricultural Districts	Development Rights ³	Differential valuation for estate and inheritance taxes	Development Permits	Capital Gains Tax
Alabama							
Alaska	x						
Arizona	x			x			
Arkansas	x						
California	x						
Colorado	x	x					
Connecticut	x			x			
Delaware	x			x			
Florida	x	x					
Georgia					x		
Hawaii	x						
Idaho	x						
Illinois	x						
Indiana	x						
Iowa	x						
Kansas							
Kentucky	x						
Louisiana	x						
Maine	x						
Maryland	x						
Massachusetts	x	x	x	x			
Michigan	x			x			
Minnesota	x			x			
Mississippi		x					
Missouri	x						

TABLE 7. (continued)

State	Differential Assessment ¹	Agricultural Land Zoning ²	Agricultural Districts	Development Rights ³	Differential valuation for estate and inheritance taxes	Development permits	Capital Gains Tax
Montana							x
Nebraska	x						
Nevada	x	x					
New Hampshire	x						
New Jersey	x			x			
New Mexico	x						
New York	x			x			
North Carolina	x		x				
North Dakota	x						
Ohio	x						
Oklahoma	x						
Oregon	x				x		
Pennsylvania	x	x					
Rhode Island	x						
South Carolina	x	x					
South Dakota	x						
Tennessee	x						
Texas	x						
Utah	x						
Vermont	x					x	
Virginia	x						x
Washington	x		x				
West Virginia	x			x			

TABLE 7. (continued)

State	Differential Assessment ¹	Agricultural Land Zoning ²	Agricultural Districts	Development Rights ³	Differential valuation for estate and inheritance taxes	Development permits	Capital Gains Tax
Wisconsin	x						
Wyoming	x	x					

¹ Includes pure preferential assessment, deferred taxation, and restrictive agreements.

² Includes exclusive form use (EFU) Zoning.

³ Refers to purchase or transfer of development rights, purchase and resale or lease with restrictions, or pre-emption.

use in each state. Table 8 is a summary of proposed legislation or planning studies related to the preservation of agricultural land.

At the present time 46 states have some form of differential assessment for property tax. The remaining four states have proposed legislation for differential assessment. Implementation of other types of programs is scattered; only 20 states have any other programs legislated and not all of those are actually in use. In spite of the increasing concern for issues of agricultural land preservation only nine states are presently proposing to implement programs other than differential assessment. Five of the 20 states with preservation legislation on the books are attempting to modify or strengthen existing programs.

Although the question of intent or purpose of agricultural land preservation strategies was addressed in Chapter II, the question may still be raised as to why these particular states have gone beyond the largely unsuccessful differential assessment techniques. For those states which are more advanced in statewide land-use planning it is, perhaps, logical that agricultural land would be specifically included in planning efforts (such as Oregon). There are a few possible explanations for which other states have enacted legislation beyond differential assessment laws. Several of the states have

TABLE 8. Proposed Agricultural Land Preservation Programs and/or State Planning Activities

State	Differential Assessment	Agr. Land Zoning	Dev. Rights	State Plan ¹	Study ²
Alabama	x				
Alaska					
Arizona					x
Arkansas					
California	x		x	x	
Colorado					
Connecticut					
Delaware					
Florida				x	x
Georgia					
Hawaii					
Idaho					x
Illinois					
Indiana			x		x
Iowa					
Kansas	x				
Kentucky					
Louisiana					
Maine					x
Maryland			x		
Massachusetts					
Michigan					
Minnesota		x	x	x	
Mississippi	x				
Missouri					
Montana		x			x
Nebraska					
Nevada					
New Hampshire					
New Jersey					
New Mexico					
New York					
North Carolina					
North Dakota					
Ohio					
Oklahoma					
Oregon					
Pennsylvania		x		x	
Rhode Island			x		x
South Carolina					
South Dakota		x			
Tennessee					x
Texas					x
Utah					x

TABLE 8. (continued)

	Differential Agr. Land	Dev.	State	
State	Assessment	Zoning	Rights	Plan ¹
				Study ²
Vermont				
Virginia			x	
Washington				x
West Virginia				
Wisconsin		x	x	
Wyoming				

¹Agriculture is to be recognized as an important element in the state planning document (i.e. Comprehensive Plan or Land Use Plan). May be specified policies or goals for agricultural land. May require local comprehensive plans.

²State is currently studying agricultural land preservation issue in order to prepare recommendations for legislature.

strong environmental legislation, which includes agricultural land. Another reason is the conflict between high density urban population and agricultural activities in states with significant farm income. Those states in the northeastern section of this country fall into this category. State planning activities with regard to environmental issues are summarized in Table 9.

Conclusion

There has been a great deal of attention to the preservation of agricultural land. A number of strategies or programs have been implemented or proposed to achieve this goal. However, the impact of preservation programs is not only on land use patterns, but also may be on the economy of the local area, or even the state. A program affecting farmland may affect the agricultural infrastructure in the area, resulting in some changes in those businesses which serve the agricultural community. Therefore, it is necessary to consider not only the merits of the proposed program, but also its probably impact upon the community or the surrounding region. There may be changes in patterns of urban growth and development, residential locations, industry locations, etc. The decision-makers need some means for determining the preferred strategy to achieve their goals. They also need an adequate information base for the evaluation of a program as it relates to their own area. The following chapter,

TABLE 9. A Summary of Selected State Land Use Planning Programs for States with Agricultural Preservation Programs.

State	Type of State Program							Ranking of Environmental Protection Goal ⁸	Ranking of Economic Issues ⁸	Ranking of Growth Strategy ⁸
	Coastal Zone I	Wetlands Mgt. ²	Power Plant Siting ³	Surface Mining ⁴	Critical Areas ⁵	Flood plain Mgt. ⁶	State Shore Land Act ⁷			
Alaska	x		x					2	5	1*
California	x		x	x		x		5	5*	3*
Colorado			x	x	x	x		3	4	1
Connecticut	x	x	x			x		3	5	1*
Delaware	x	x					x	4	5	3*
Hawaii	x		x	x	x	x		3	5	2*
Maryland	x	x	x	x	x	x		2	4	3
Massachusetts	x	x	x					3	5	4
Michigan	x			x		x	x	2	5	4*
Mississippi	x	x				x		1*	5	1*
Nebraska			x			x		2	4*	3*
New Jersey	x	x	x			x		3*	5	1
New York	x	x	x	x	x	x		2	4	3
Oregon	x		x	x	x	x		3	5	1*
South Carolina	x		x	x	x			5	5	1
Vermont		x	x	x		x		3*	4	2
Virginia	x	x	x	x				3	5	3
Washington	x	x	x	x		x	x	3	5	5
Wisconsin	x	x	x	x	x	x		3	4	2*

TABLE 9. (continued)

State	Type of State Program					Ranking of Environmental Protection Goal ⁸	Ranking of Economic Issues ⁸	Ranking of Growth Strategy ⁸
	Coastal Zone	Wetlands Mgt. ²	Power Plant Siting ³	Surface Mining ⁴	Critical Areas ⁵	Flood Plan Mgt. ⁶	State Shore Land Act ⁷	
Wyoming			x		x		5	1 5

¹Participation in federally funded coastal zone management program under Coastal Zone Management Act of 1972.

²Planning for or controlling land use in wetlands.

³Determination of sites for power plants and related facilities.

⁴Regulation of surface mines.

⁵Establishment of rules, regulations, or guidelines for identification and designation of areas of critical state concern (i.e., environmentally fragile areas).

⁶Regulation of floodplains.

⁷Regulation of shorelands of significant bodies of water.

⁸Ranked by state planning directors; as an evaluation of legislative objectives 5 = most important, 1 = least important, as compared to other goals of protection of individual property rights, provision for low income housing, growth strategy, economic issues, or environment protection;

*Means becoming relatively more important.

therefore, addresses those factors important in formulating and implementing a program for agricultural land preservation.

CHAPTER IV

IDENTIFYING AND SELECTING AGRICULTURAL

LAND FOR PRESERVATION

There is little doubt that the preservation of agricultural land has been a goal in much land use planning activity. There are several important steps in the decision to implement measures to preserve agricultural land. The land to be included in a preservation program must be identified and/or classified. Eligibility criteria must be established; not all agricultural land identified as prime, unique, or important farmland should be preserved. There must be a basis for the decision to preserve farmland. Key factors in this decision must be identified, as well as some consideration of the differences in decision-making depending upon the level of government, the geographic area, political jurisdictions, etc. This chapter addresses these considerations, including suggestions on how to approach the preservation decision.

Identifying Prime or other Agricultural Land

Most attempts to identify and classify agricultural land begin with the identification of productive soils. The Soil Conservation Service has developed a Land Capability Classification System under which soils are divided into eight classes (see Appendix A for Land

Capability Classification).¹ In addition, the Soil Conservation Service has begun to inventory the agricultural lands within each state in order to further classify the land as prime, unique, of statewide importance, or of local importance.

Prime agricultural land is best suited for providing food, feed, forage, and fiber crops. It has the soil quality, growing season, and moisture supply needed for sustained high yields when managed according to modern farming methods. This usually includes Class I, II, and III soils.

Unique agricultural land can provide specific high value food and fiber crops. Although not prime, it is important due to the combination of soil quality, location, growing season, and moisture supply. When managed with modern farming and conservation methods it is highly suited for a specific crop of sustained high quality.

Agricultural land of statewide importance contributes to the production of forage, feed, food, and fiber and is an important contribution to the state's economy. The soil capability class may vary from Class I to IV.

Agricultural lands of local importance are identified at

¹Soil Conservation Service, National Inventory of Soil and Land Conservation Needs (Washington, D.C.: U.S. Department of Agriculture, 1967).

the local level based on their importance to the local economy. While these lands may be of more marginal productivity compared to the above classifications, they may be important to the maintenance of agriculture as a viable activity at the local level. These lands lack soil fertility, slope, water table or other characteristics defining the above categories; however, these lands are in agricultural use and are important for food and fiber production.² Appendix C includes the specific criteria for each category of agricultural land.

The identification and classification of agricultural lands is only a first step, however. Knowing the location of prime or unique farmlands does not mean that the landowner will decide to farm it, that economic or other community pressures will allow the landowner to farm it, or that local, state, or national programs will provide incentives to keep the land in agricultural production. What this inventory can do is help assure that decisions are made with the knowledge of soil and other characteristics of the land. It can be an initial step in assisting decision-makers to determine the real cost of removing a

²Soil Conservation Service, "Prime and Unique Farmlands," Land Inventory and Monitoring Memorandum No. 3 (Washington, D.C.: U.S. Department of Agriculture, 1975); "Prime, Unique and other Farmlands," Land Inventory and Monitoring Memorandum UT-1 (Washington, D.C.: U.S. Department of Agriculture, 1977).

parcel of land from agricultural production.³ However, this inventory is only one of the many factors which may be considered in the decision regarding the preservation of certain agricultural lands.

Factors in the Agricultural Land Preservation Decision

In addition to identifying and classifying agricultural land based upon physical characteristics (soil capability or soil quality combined with such things as moisture supply or growing season), there are other key factors necessary to the identification of farmland which should be preserved. The various strategies and land use controls are not likely to be successful in keeping land in farms unless agriculture is a viable economic activity. Factors which contribute to the viability of agriculture include physical constraints (i.e. soil quality or climatic conditions), retirement of marginal farmland, prices received by farmers, the costs of supplies and services, the location of the farming infrastructure (such as processors or markets), environmental regulations and restrictions on pesticides, fertilizers, and manure disposal, and the availability of land to expand farm operations.⁴ There are other factors which affect the

³Wasatch Front Regional Council, Agricultural Preservation, Preliminary Draft, Salt Lake City, Utah, 1978, pp. 50-55.

⁴Robert E. Coughlin and others, Saving the Garden:

conversion of land from rural or farm uses to urban uses. Most of these factors relate to the land market and include the actors (landowners, speculators, developers, government agencies, or lending institutions), demand, availability, the market processes, and the price paid for the land. Demand characteristics include location of the public infrastructure, accessibility, and the availability of services and amenities.⁵

Another researcher has identified four sets of factors which may affect a farmer's decision to convert his land to a non-agricultural use. These are:

Demographic-the farmer's age, health and proximity to retirement; the presence of children who wish to continue farming; retirement; death.

Economic-the offering price for the land; the net return to agricultural operations; high property, estate, and inheritance taxes; transportation costs.

Transitional-the desire of a farmer to farm elsewhere, or to pursue a different occupation.

Secondary-externalities such as complaints from neighbors about fertilizer odor, pesticides, and herbicides; air and water pollution from nearby industries; decrease in the availability of farm labor and suppliers; and nuisance elements such as decreased traffic.⁶

The Preservation of Farmland and other Environmentally Valuable Land (Philadelphia: Regional Science Institute, 1977), pp. 101-111.

⁵Ibid., pp. 78-95.

⁶John C. Keene, "Keeping Farmers Farming," Environmental Comment, January, 1978, p. 9.

Various sets of factors may be included in the decision regarding the preservation of farmland. Regardless of the specific factors considered, they may generally be grouped in the following categories: characteristics of the owner, characteristics of the land, characteristics of the area, or public policies. Those physical considerations discussed in the previous section would generally fall under characteristics of the land. Owner characteristics include such things as age, non-farm job opportunity, lifestyle, and so forth. Area characteristics include the land market, urban infrastructure, agricultural infrastructure, and externalities (i.e., complaints about odors). Environmental regulations or tax policies are examples of public policies which affect the land. Figure 2 is a graphic representation of these relationships. (Table 10 contains a list of factors which may be included in each category.)

Attention is usually focused on the land and its physical characteristics in discussions of the preservation of agricultural land. However, as discussed in Chapter II, there are many reasons for agricultural land preservation programs. The other factors (in addition to physical characteristics of the land) may become more important if the purpose is to preserve a rural-lifestyle, retain open-space (in the form of farmland), or retain farming as a viable economic activity. In addition, the designation of land for retention as active farmland will probably require some trade-offs. The decision-makers must consider

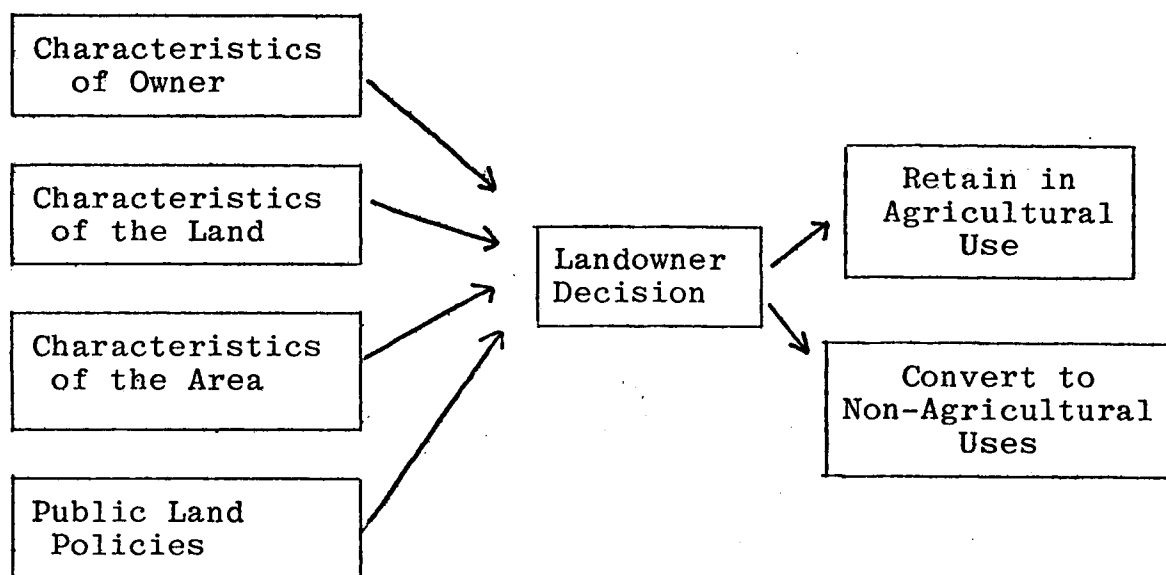


Figure 2. Factors affecting the decision to retain or convert agricultural land.

Table 10. Checklist for Use in Selecting Agricultural Land for Preservation or Conversion

Factors	Agricultural Land Use	Conversion to other uses	
<u>Public Land Policies</u>			
.Local tax base			
.Other taxes (i.e., estate or inheritance)			
<u>Landowner(s) Considerations</u>			
.Owner acceptance			
.Lifestyle			
.Non-farm job availability			
<u>Parcel Characteristics</u>			
.Soil quality			
.Drainage			
.Water supply			
.Irrigation needs			
.Location			
.Value-agricultural			
.Value-market			
.Compatibility with adjacent uses			
.Accessibility			
.Return on investment			
.Unique quality ¹			
.Productivity			
<u>Area Characteristics</u>			
.Land availability			
.Urban infrastructure			
.Agricultural infrastructure ²			

Table 10. (continued)

Factors	Agricultural Land Use		Conversion to other uses
.Labor force			
.Community acceptance			
.Political acceptance			
.Aesthetics			
.Contribution of agriculture to local economy			
.Environmental consideration ³			

¹Unique qualities include such things as specialty crops or critical areas.

²Agricultural infrastructure includes such things as feed dealers, processors, or markets.

³Environmental considerations include such things as air or water quality problems from either the present or proposed use.

the land needs of both agricultural and non-agricultural interests.

It is inevitable that agricultural land, some of it prime, will be converted to non-farm uses. However, it may not be reasonable to establish a policy at any level of government which says that all Class I (or Class II, or prime, etc.) land must be preserved for agricultural use. It may be reasonable, on the other hand, to suggest that there is some means of guiding this conversion to less valuable (socially as well as economically) agricultural land whenever possible. This can be accomplished through the careful identification and selection of agricultural land to be preserved. Other agricultural lands could be available for development.

Another important element to be considered in the preservation of agricultural land is the determination of the value of land. Many states have established guidelines for property tax appraisers to use in determining the agricultural value of land eligible for preferential assessment.⁷ Under the assumption that the total market value of farmland can be divided into agricultural value and speculation

⁷In addition, the International Property Assessment Administration has prepared a book on Use-Value Farmland Appraisal, which could be used along with standard texts on land appraisal.

components, Bell⁸ has developed an econometric model to determine the agricultural value of the land for use-value assessment. The agricultural value of the land is equal to the suitability of the land to be profitably maintained in agricultural activities. The speculative component is equal to the value of the land in more intensive uses.

Once the agricultural lands have been identified and classified, and data collected on the factors discussed above, it is necessary to determine the relative importance of these factors. Little work has been done to date on determining the importance of each factor or the sets of factors and translating this information into the delineation of agricultural land for preservation. Frequently the designated agricultural areas are temporary or transitional, rather than the agricultural use being viewed as a permanent use of the land. Therefore, only a few factors have been considered in identifying eligible land in previous studies.

Selecting Agricultural Land for Preservation

As discussed earlier in this chapter there has been considerable attention devoted to identifying and classifying agricultural land. There has also been some recent attention to the identification of agricultural land which would be eligible for preservation. Many factors influencing the

⁸Michael Bell, "Use Value Assessment and the Agricultural Value of Farmland," Assessors Journal, June, 1977, pp. 95-104.

the private decision to preserve agricultural land have been identified. There is a need, however, to establish an appropriate methodology for use in the public sector in selecting agricultural lands for preservation. As shown in Figure 2, many factors influence the landowner's decision to retain his land in agricultural use or convert his land to another use. These same sets of factors may also be included in a public decision regarding the preservation of agricultural land. While the capability of the land for agricultural activities is important, it is also necessary to consider social, economic, and overall land use needs in the area.

A few local areas have established a procedure for delineating agricultural regions or districts, based primarily upon mapping agricultural lands (identified and classified as discussed earlier) along with some considerations of the economic viability of the agricultural activity.⁹

⁹The following documents may be useful to the reader interested in this methodology: Metropolitan Council, Agricultural Planning Handbook (St. Paul: Metropolitan Council, 1976); Puget Sound Government Conference, Regional Agriculture, Land Use Technical Study (Seattle: Puget Sound Governmental Conference, 1974); Donn Derr, Leslie Small, and Pritam Dhillan, "Criteria and Strategies for Maintaining Agriculture at the Local Level," Journal of Soil and Water Conservation, Vol. 32, 1977, pp. 118-211; Wasatch Front Regional Council, op. cit., pp. 56-64; Michigan Department of Natural Resources, The Use of Zoning to Retain Essential Agricultural Lands, 1977. J. Nicholas Van Driel, "Computer Mapping for Guiding Suburban Development," Ekistics, Vol. 264, 1977, pp. 266-272.

Generally, a map is prepared which identifies those areas of prime, unique or important farmland. A second map identifies existing urban or suburban areas as well as identifying those areas likely to be developed based upon the existence of urban infrastructure. In a highly simplified approach, those areas on the first map and not on the second map would be eligible for preservation. Figure 3 shows this procedure.

Another method which could be used would be an approach similar to that used in impact assessment. While this approach has been suggested in the context of resource use decisions¹⁰ as well as in establishing priorities for all types of land use,¹¹ it has not been used exclusively for agricultural land use decisions. A checklist, such as the example shown in Table 10, could be prepared for use in summarizing the data collected.

Data collection and analysis is an important step in the decision-making process for agricultural land preservation. The data may be collected for categories such as to those shown in Figure 2. The data collected should be for those parcels of land being considered for inclusion in a preservation program. The list of suggested data

¹⁰W.W. Miller, C.T.K. Ching and G.N. Benesch, "Framework for Making Resource Use Decisions: An Application to Subdivision Development," Long Range Planning, Vol. 11, 1978, pp. 72-80.

¹¹Arthur C. Rathburn, Designation of Priorities for Land Use, AE Series #166 (University of Idaho, 1976).

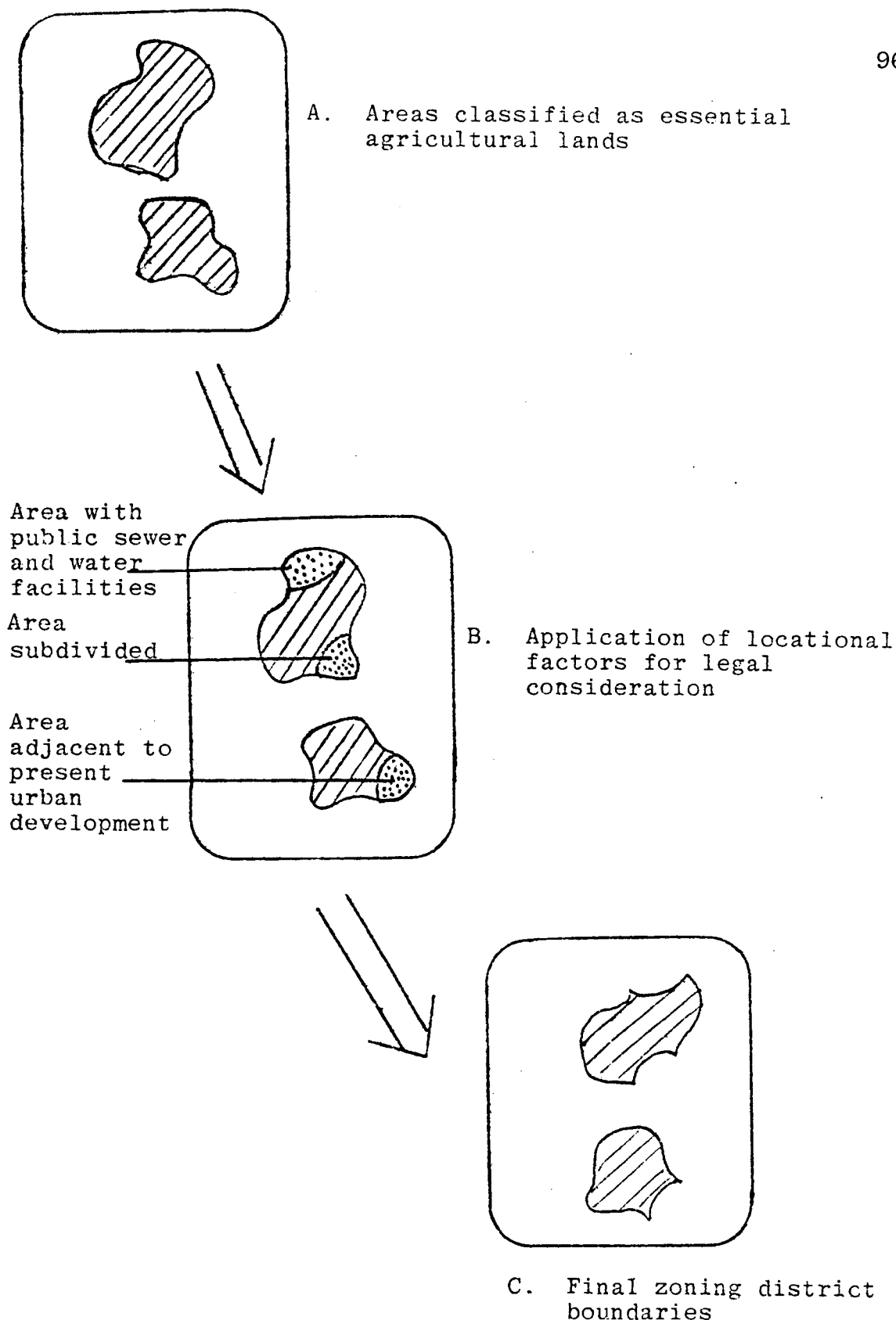


Figure 3. Delineating the Agricultural Zoning District

Source: Michigan of Natural Resources, The Use of Zoning to Retain Essential Agricultural Lands, 1977, p. 40.

requirements is shown in Table 10.

One way of summarizing the data could be to indicate the probable impact of the retention or conversion of the land under consideration upon the factors included in the table. For example, consider the urban infrastructure of an area. Converting a portion of the agricultural land in this area to residential use (as an example) could result in significant negative impacts on the urban infrastructure. Retaining the land in agricultural use for a short or long time period may have little or no impact upon the existing infrastructure.

It is important to note that one factor or set of factors cannot be considered in isolation. In the above example, impacts on the infrastructure may only be important if the land is converted. However, if agricultural activity (another example in Table 10) contributes significantly to the local economy, the impact of the loss of agricultural activity could be quite negative. There could be a variation in the nature of the impact based upon considering the land for short term or long term agricultural use.

The use of a checklist such as this example would help to insure the consideration of as many factors as possible in selecting land for preservation or allowing conversion to other uses. This table shows one means of summarizing the combined effects of the individual factors in the identification and selection of agricultural land for preservation.

Differences Due to Scale

Not all criteria are important in every area. For land use decisions at the county level, consideration of the property tax, the existence of an urban infrastructure, or the availability of land for a variety of uses may be of greater importance than other factors. However, at the state level, problems of labor supply, unemployment resulting from lack of support for a large agricultural infrastructure, or consideration of the total contribution of agriculture to the economy may weigh more heavily. Therefore, it is necessary for the analyst to establish a priority among the various factors used in the preservation decision.

Not only will the factors used in the decision-making process differ with the scale or size of the area under consideration, but also the method of analysis may differ. A mapping of the available data may be sufficient for small areas; however, for decisions concerning agricultural land statewide, additional data may be necessary which does not lend itself to analysis by mapping. Mathematical models may be useful in determining the agricultural use value of land, but may have little application for other factors in the decision. Therefore, the planner, analyst, or decision-maker must consider those factors which are most important for his area of concern, combined with the best method of analysis for the area.

The strategy to be implemented to accomplish the preservation of agricultural land may also differ due to

geographic area. Different problems require solutions at different levels of government. The techniques to preserve farmland were discussed in Chapter III, primarily as used by the state governments. It should be noted that most techniques can be used, and have been, by local governments. For example, at the county level, the people may perceive a strong need to preserve agricultural productivity and may implement a strict preservation technique requiring a commitment of public funds and support. At the state level, however, the need for the retention of agricultural activities may be a lower priority and a uniform statewide action may not be needed. In addition, agricultural areas may differ within the same state, requiring a variety of strategies.

Therefore, while the decision-makers should attempt to implement programs which are appropriate for their own area, there should be some means for making such decisions within an overall framework established at the regional or state level. There may be a need for state policy to be established which can provide guidance to the local decision-maker when considering agricultural land preservation programs.

CHAPTER V

RECOMMENDATIONS AND CONCLUSIONS

Concern for the preservation of farmland has been increasing in recent years. This is due primarily to greater attention to losses of farmland to urban and other uses, stricter regulation of chemicals used in farming, a growing emphasis on the protection of environmentally sensitive or unique lands, and increased attention to the aesthetic and open space attributes of farmland. It is generally agreed that the overall supply of agricultural land is not critically low. The United States can meet not only the anticipated domestic food needs, but also moderately high export demands. There is concern, however, that past increasing rates of productivity cannot be continued, that new cropland development is uncertain, and that energy scarcity and environmental regulations will require more land intensive technology. Pressures brought by urban dwellers or planners for the preservation of agricultural land may be for aesthetic reasons, such as a pleasing landscape or more open space in or near the city.

The Role of Planning

There is a real need to approach the agricultural land preservation issue from a traditional planning perspective. This means that preservation strategies could be selected to further the goals and objectives of such preservation.

Collecting and analyzing data on a variety of factors important in the decision to retain or convert farmland would provide a larger base of information to the decision-maker. Not only should the agricultural land itself be considered, but also the entire combination of land uses and the relationship of agricultural land to the other uses (residential, industrial, transportation, etc.). Through the planning process goals are established and issues identified. Alternative approaches for preservation can be evaluated and one selected which will meet the needs of the community as much as possible. This comprehensive approach can ensure not only that adequate agricultural land is retained to meet the needs of the community, but also that such farmland retention allows adequate land for other development. Agricultural land use and preservation are thus a part of an overall land use planning effort.

In a recent publication William Toner summarized some important considerations for planners.¹ He outlined key elements to a successful local program of farmland preservation. These elements are summarized as follows:

The active participation of the agricultural community is essential to the technical as well as the political success of the program.

Flexibility is necessary in designing a preservation program which allows the farmer some potential gain for selective development.

¹William Toner, Saving Farms and Farmlands: A Community Guide, PAS Report No. 333 (Chicago: American Society of Planning Officials, 1978), pp. 5-8.

A combination of tools available at the local level will be more likely to produce the desired result than a single approach.

Statewide programs, such as tax incentives, can enhance the local preservation efforts.

Preservation proposals should be balanced; that is some land must be available for development as well as being retained in agricultural use.

Preservation of farming and farmland must be part of a larger planning program.

Two approaches are suggested by Toner² in planning to save farms and farmlands. "Regulate First, Plan Second" is an approach to be used when there is political consensus that preservation is needed and when the agricultural area is under strong development pressure. This approach is also useful when the technical skills and data sources are insufficient for the more traditional planning process. This more traditional planning process is suggested as the second approach, "Plan First, Regulate Second."

Federal, State, and Local Land Use Policy

A framework for land use policies is needed which recognizes the different interests to be served at either federal, state, or local government levels. While the U.S. Department of Agriculture has a specifically stated policy with regard to agricultural land use,³ there is

²Ibid., pp. 9-10.

³Refer to Chapter II for a discussion of the position of U.S.D.A. on agricultural land use.

currently no national land use policy. Even though there is a policy statement on the preservation of agricultural land⁴ it is probably not realistic to expect local land markets to reflect national demands for agricultural products.⁵ The interrelationship of the different levels of government in land policy formulation is well summarized in the following comments:

Land policy has been significantly influenced, if not dictated, by the powers or authorities available at different levels of government. Under current national land use policy proposals there would be some integration of these powers and authorities. The federal spending power would be used to encourage states to plan and in some cases regulate land use. This is a function that has traditionally been delegated by the states to local governments.

In agricultural land policy, as with land use policy generally, the state has a key role because it is the unit of government with the broadest constitutional base in our system. Of particular importance is the state's control over local government options. It is clear that local needs vary and are determined by such factors as geography, economic and population growth, and political philosophy and institutions. Hence, no one policy tool can be designed to serve

⁴John A. Knebel, "Statement of Prime Farmland, Range, and Forest Land," Secretary's Memorandum No. 1827, Supplement No. 1 (Washington, D.C.: U.S. Department of Agriculture, 1976).

⁵B.L. Dillman, "Preservation of Agricultural Land: State and Local Perspectives, Community Values and Policy Implementation," paper presented at the annual meeting of the American Agricultural Economics Association, Blacksburg, Va., August, 1978.

all state and local agricultural land policy needs. State policy should seemingly provide not only for meeting statewide needs but also provide legislative flexibility for local governments to exercise a range of policy options adapted to varied local circumstances.

Historically, the selection of land use policy instruments has been a choice between incentives or controls. Experience with either tends to suggest some mix is best. . . . For example, differential property tax assessment, the predominant tool in past agricultural land preservation policies, appears to function more effectively in a land use sense as a supplement to some land use control. The relative weight given to incentives or controls must vary depending on the public objectives in the particular land use planning setting and the efficacies of guiding private decisions toward those objectives.⁶

The federal government, or a single federal agency, cannot define a single policy which accounts for the wide variety of local circumstances. They should, however, strive to provide uniformity among programs and administrative simplicity in program recommendations. The state role needs better identification. State governments should adopt a policy regarding agricultural land preservation. Regions of the state need to develop a comprehensive land use plan identifying land to be preserved based on state guidelines and policy.⁷ Local governments need a strategy

⁶William D. Anderson, Gregory C. Gustafson, and Robert F. Baxley, "Perspectives on Agricultural Land Policy," Journal of Soil and Water Conservation, Vol. 30, 1975, pp. 42-43.

⁷Eleanor W. Blakey, "The Preservation of Lands for Agricultural Endeavors," a workshop, March, 1976.

There is a need, perhaps, to establish a hierarchy of goals, objectives, and policies regarding agricultural land preservation. In this way, decisions made at local government levels would be consistent with state needs. In addition, local and state objectives and policies for farmland preservation would fit within national goals. Although different interests are served at each governmental level, such a hierarchy could result in a more logical and consistent approach to farmland retention at local, state, and national levels. This may be more important, however, in balancing state and local goals than in the relationship of national goals to other government levels, especially from the viewpoint of land use planning.

Future Research Needs

Little research effort has been directed toward developing an adequate data base for use in decision- and policy-making regarding agricultural land and its preservation or conversion. While this thesis has identified numerous factors involved in the decision to retain farmland or convert it to other uses, additional research is needed to study the inter-relationships and linkages among these factors. The costs of conversion, social as well as economic, need to be clearly specified, and if possible, incorporated into a model for decision-making. As croplands are converted, the economic and social costs of bringing noncropland into productive use need to be identified.

The problems of agricultural land use are complex. Greater attention is needed to the factors determining land use and the importance of the factors at local, state, or federal levels of government.

Many state and local governments are implementing land use controls designed to preserve agricultural land.

However, a careful analysis of the need for preserving farmland or the farming activity is necessary to determine the strategy or the combination of tools best suited to the local situation. This, too, requires an adequate data base on land uses, the availability of land, and the demand for land, as well as the social and economic costs mentioned above. There is a definite need for coordination among the many agencies, legislatures, farmers, and urban dwellers who are concerned with agricultural land preservation, and who may be attempting to design and implement preservation programs. A coordination of these many activities could result in consistency of data that is collected by various agencies or individuals.

An analysis of program success and failure would provide valuable information to decision-makers. While only a few types of programs have been implemented, the specific provisions vary considerably from one area to another. More information is needed on how the problems are addressed, what programs are tried, and whether these programs have been effective. For example, the use of deferred taxation was introduced in an effort to recapture tax revenues at

the time of land conversion. Without this feature, pure preferential assessment gave some land speculators an inequitable tax break. There are advantages as well as problems with the many preservation programs implemented thus far. A better information base on the use of these programs would aid planners and decision-makers in establishing programs in their own areas and allow them to benefit from the experience of others.

The major federal agency involved in issues of agricultural land use and policy, the U.S. Department of Agriculture, has defined a number of areas of research needs.⁹ Characteristics of landowners and their plans for their land would be useful in resolving land use conflicts. Policy-makers need a continuing assessment of competitive, and often conflicting, demands for agricultural land. Direct and indirect impacts of urbanization on agriculture need more research and information. Decisions to develop, improve, or even retire farmland have economic and social consequences beyond the farmer. Supporting agricultural industries are affected as well as the surrounding community. Such adjustments need careful analysis as steps are taken to minimize social costs. Finally, there is a need to evaluate existing tools for regulating or influencing land

⁹Melvin L. Cotner, Land Use Policy and Agriculture: A State and Local Perspective, ERS-650 (Washington, D.C.: U.S. Department of Agriculture, 1977).

use and to suggest improvements to these tools.

Conclusions

It has been the purpose of this thesis to establish a framework for future research into issues related to agricultural land preservation--the need to preserve agricultural land, an evaluation of existing techniques for preservation, goals and policies guiding preservation activities, and factors involved in preservation or conversion decisions.

Although agricultural land is undergoing continued conversion to other uses, this conversion apparently does not present a serious threat to food and fiber production at the national level. Nevertheless, agricultural land preservation is a major issue of land policy for many state and local governments. Agricultural land may represent an important physical, social, aesthetic, or economic asset to be preserved or maintained.

Preservation strategies may be grouped into three types of approaches: development rights, regulation, and tax policies. No single program is preferable for the preservation of agricultural land in all situations. In fact, the best approach may be a combination of existing programs, in order to take advantage of the best features of several approaches while mitigating some of the undesirable effects.

Planning should have a major role in land use decisions

and policy. There is a need to develop an adequate data base for evaluating agricultural land uses. Planning in farm areas requires consideration not only of differing goals, values, lifestyles, and land use needs, but also a means for identifying and classifying agricultural lands. Some factors to be considered in the agricultural land preservation or conversion decision have been identified. However, this area needs considerable additional research, not only in identifying the factors but in exploring the inter-relationship of these factors.

Approaching the agricultural land preservation issue through the traditional planning process would address many of the problems raised in this study. This would result in a clarification of the goals, collecting and analyzing data on land uses, consideration of alternative strategies in preservation, and establishing a set of criteria against which to make decisions regarding preservation or conversion. As an on-going process, planning can help accomodate the changing needs for land for a variety of uses in our society.

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APPENDIXES

APPENDIX A

LAND CAPABILITY CLASSIFICATIONS

Class I

Soils in Class I have few limitations that restrict their use. These soils are suited to a wide range of plants and may be used safely for cultivated crops, pasture, range, woodland, and wildlife food and cover. They are nearly level, and wind or water erosion hazards are low. They are deep, well-drained, and easily worked. They hold water well and are well supplied with plant nutrients, or are highly responsive to fertilizer.

Soils in Class I that are used for crops need only ordinary management practices to maintain productivity--both soil fertility and soil structure. Such practices may include the use of commercial fertilizers, cover and green-manure crops, conservation of crop residues and animal manures, and crop rotations.

Often they have few soil limitations for urban development.

Class II

Soils in Class II have some limitations that reduce the choice of plants or require moderate conservation practices.

Soils in this class require careful soil management, including conservation practices, to prevent deterioration

or to improve air and water relationships under cultivation. The limitations are few and the practices are easy to apply. The soils may be used for cultivated crops, pasture, range, woodland, or for wildlife food and cover.

Limitations of soils in Class II may include singly or in combination the effects of: (1) gentle slopes; (2) moderate susceptibility to wind or water erosion, or moderate adverse effects of past erosion; (3) less than ideal soil depth; (4) somewhat unfavorable soil structure and workability; (5) slight to moderate salinity or alkalinity, easily corrected but likely to recur; (6) occasional damaging overflow; (7) wetness correctible by drainage but existing permanently as a moderate limitation; and (8) slight climatic limitations on soil use and management.

Some have few soil limitations for urban development. Others may have severe limitations.

Class III

Soils in Class III have severe limitations that reduce the choice of plants or require special conservation practices or both.

Soils in Class III have more restrictions than those in Class II, and when used for cultivated crops, the conservation practices are usually more difficult to apply and to maintain. They may be used for cultivated crops, pasture, woodland, range, or for wildlife food and cover.

Limitations of soils in Class III restrict (1) the

amount of clean cultivation, time of planting, tillage, and harvesting; (2) choice of crops; (3) or a combination of these items. The limitations may result from the effects of one or more of the following: (1) moderately steep slopes; (2) high susceptibility to water or wind erosion or severe effects of past erosion; (3) frequent overflow accompanied by some crop damage; (4) very slow permeability of the subsoil; (5) wetness or some continuing water-logging even after drainage; (6) shallow depths to bedrock, hardpan, or claypan than limits the rooting zone and the water shortage; (7) low moisture-holding capability; (8) low fertility not easily corrected; (9) moderate salinity or alkalinity; or (10) moderate climatic limitations.

They usually have moderate to severe soil limitations for urban development.

Class IV

Soils in Class IV have very severe limitations that restrict the choice of plants, require very careful management, or both.

The restrictions in use for these soils are greater than those in Class III, and the choice of plants is more limited. When these soils are cultivated, more careful management is required and conservation practices are more difficult to apply and maintain. Soils in Class IV may be used for crops, pasture, woodland, range, or for wildlife

food and cover.

Soils in Class IV may be well suited to only two or three of the common crops or production may be low in relation to inputs. Use for cultivated crops is limited as a result of the effects of one or more permanent features such as (1) steep slopes; (2) severe susceptibility to water or wind erosion; (3) severe effects of past erosion; (4) shallow soils; (5) low moisture-holding capacity; (6) frequent overflow accompanied by severe crop damage; (7) excessive wetness and a continuing hazard of water-logging even after drainage; (8) severe salinity or alkalinity; or (9) a moderately adverse climate.

Some soils in Class IV are well suited to one or more of the special crops, such as fruits or ornamental trees and shrubs, but this suitability itself is not sufficient to place a soil in Class IV.

Many of these have moderate or severe soil limitations for urban development.

Class V

Soils in Class V have little or no erosion hazard, but have other limitations that are impractical to remove. These problems limit their use largely to pasture, range, woodland, or wildlife food and cover.

Soils in this class have limitations that restrict the kind of plants which can be grown and also prevent normal tillage of cultivated crops. They are nearly level,

but some are wet, and frequently overflowed by streams, are stony, have climatic limitations, or have some combination of these limitations. Examples of Class V are (1) bottom land soils; (2) nearly level soils in areas with a growing season that prevents the normal production of cultivated crops; (3) level or nearly level stony or rocky soils; and (4) ponded areas where drainage for cultivated crops is not feasible but where soils are suitable for grasses or trees. Because of these limitations, common crops are not feasible but pastures can be improved and benefits from proper management can be expected.

Class VI

Soils in Class VI have severe limitations that make them generally unsuitable for cultivation and limit their use largely to pasture or range, woodland, or wildlife, food and cover.

Physical conditions of soils placed in Class VI are such that it is practical to apply range or pasture improvements, if needed, such as seeding and water control. Soils in Class VI have continued limitations that cannot be corrected, such as (1) steep slopes; (2) severe erosion hazard; (3) effects of past erosion; (4) stoniness; (5) shallow rooting zone; (6) excessive wetness or overflow; (7) low moisture capacity; (8) salinity or alkalinity; or (9) severe climate. Because of one or more of these limitations, these soils are not generally suitable for

cultivated crops. They may be used for pasture, range, woodland, wildlife food and cover, or some combination of these.

Some soils in Class VI can be safely used for the common crops provided unusually intensive management is used. Other soils in this class are adapted to special crops such as sodded orchards, blueberries, etc.

Class VII

Soils in Class VII have very severe limitations that make them unsuitable for cultivation and that restrict their use largely to grazing, woodland or wildlife use.

Physical conditions of soils in Class VII make it impractical to apply such pasture or range improvements as seeding, fertilizing, and water-control measures. Soil restrictions are more severe than those in Class VI because of one or more continuing limitations that cannot be corrected, such as very steep slopes, erosion, shallow soil, stones, wet soil, salts or alkali, unfavorable common cultivated crops. They can be used safely for grazing, woodland, wildlife food and cover, or some combination of these under proper management.

They are not suited to any of the common cultivated crops; in unusual instances, some soils in this class may be used for special crops under unusual management practices. Some areas of Class VII may need seeding or planting to protect the soil and to prevent damage to adjoining areas.

Class VIII

Soils and land forms in Class VIII have limitations that preclude their use for commercial plant production and restrict their use to recreation, wildlife, water supply, or aesthetic purposes.

Soils and land forms in Class VIII cannot be expected to return significant on-site benefits from management for crops, grasses, or trees, although benefits from wildlife use, watershed protection, or recreation may be possible.

Limitations that cannot be corrected may be caused by one or more of the following: (1) erosion, (2) severe climate, (3) wet soil, (4) stones, (5) low moisture holding capacity, and (6) salinity or alkalinity.

Class VIII includes bad lands, rock outcrops, sandy beaches, river wash, mine trailings and other nearly barren lands.

APPENDIX B

UNITED STATES DEPARTMENT OF AGRICULTURE

OFFICE OF THE SECRETARY

Washington, D.C. 20230

SECRETARY'S MEMORANDUM

No. 1827, Supplement 1

The continued loss of lands well suited to the production of food, forage, fiber, and timber, and the degradation of the environment resulting from those losses is a matter of growing concern to the Nation. Major consideration must be given to prime lands and the long-range need to retain the productive capability and environmental values of American agriculture and forestry. Developments that result in irreversible land use changes represent a loss of valuable natural resources. The process is dramatic in some local areas. At the national level, individual losses appear small, but the cumulative effect can adversely impact domestic and international production.

The concerns about wise use of prime lands are local, Statewide, and national in scope. The loss of land suitable for sustained crop and wood production in a region or locality can influence the viability of supporting supply, processing and marketing facilities. Continued loss of farmland, range, and forest land production affects the economy locally,

influencing employment and income levels. In addition, it limits other qualities essential to the well-being of our people.

Land use alternatives are generally available that can minimize impacts on prime lands. Such alternatives should be explored carefully, particularly where Federal funds are involved. When possible, land use decisions should be avoided which irrevocably commit prime lands to non-farmland, non-range, and non-forestland uses, thereby foreclosing the options of future generations. USDA will urge all agencies to adopt the policy that Federal activities that take prime agricultural land should be initiated only when there are no suitable alternative sites and when the action is in response to overriding public need. The long-term implications of these land use conversions on the productive capacity of our farmland, range, and forest land, as well as on environmental impacts, should be evaluated and made known to the public.

The Department, through the Land Use Committee, counterpart State and local committees, and the activities of all concerned agencies, groups, and organizations will advocate the protection of prime and unique farmlands, range, and forest lands from premature or unnecessary conversion to non-agricultural land use. Urban or built-up uses and water impoundments that preclude utilization or recovery to high quality agricultural or forestry purposes are of particular concern.

State and local interests in retaining prime farmland, range, and forest land for production are often based on concerns other than the demands for food, forage, fiber, or timber. Open space, environmental quality, visual quality, and local economic impacts are often cited as reasons for protecting these lands. Many of these lands have modest production capability, but are valued because of location and other unique factors that make them of State or local importance. Retaining farmland, range, and forest land enhances local values and protects resource options for the future. The Department will make specific efforts to assist States and localities to identify lands of State and local concern and support efforts to protect these lands from premature or unnecessary conversion of other uses.

The Statement on Land Use Policy (Secretary's Memorandum No. 1827) and the following specific policies are set forth for the guidance of the agencies in this Department in regard to prime lands:

1. Advocate the protection of prime lands from premature or unnecessary conversion to other land uses. Priority will be given to prime lands threatened by conversion to irreversible land uses.
2. Assure that environmental impact statement procedures and review processes thoroughly consider and evaluate the impact of major Federal actions on prime farmland, range, and forest lands.
3. Emphasis will be placed on programs to inventory, assess and evaluate the Nation's farmland, range, and forest lands to assist decision-makers and the general public's understanding of the kind, extent, location, and current status of prime lands.

4. Cooperative efforts with States, local governments and universities will be initiated to assure concerns for food, fiber, and wood production are recognized and emphasized in the identification of prime lands.
5. USDA agency actions and programs will give thorough consideration to the local, State and national concerns for the retention of prime lands. The necessity of conversion of these lands to other uses will be considered only after a determination that feasible alternatives do not exist or that overriding public needs warrant the action.
6. The agencies in the Department will review their programs to insure consistency with the intent of this supplement.

APPENDIX C

CRITERIA FOR PRIME AGRICULTURAL LANDS

- a. The soils have an adequate moisture supply with natural rainfall in sufficient amounts to provide adequate moisture for the commonly grown crops in seven or more years out of ten. The soils have sufficient available water capacity within a depth of 40 inches, or in the root zone if less than 40 inches, to produce the commonly grown crops in seven or more years out of ten. The area also has a dependable water supply in which enough water is available for irrigation in eight of ten years for the crops commonly grown.
- b. The soils are warm enough and have a long enough growing season for crops adapted to the area. These are soils that at a depth of 20 inches have a mean annual temperature higher than 32° F (0° C).
- c. The soils are neither too acid nor too alkaline for good plant growth, having a pH between 4.5 and 8.4 within a depth of 40 inches or within the root zone.
- d. Soils are permeable to both air and water.
- e. The soils are well drained with a water table that is maintained at a sufficient depth during the cropping season to allow the crops common to the area to be grown.

- f. The soils are not flooded frequently during the growing season (less often than once every two years).
- g. Does not include soils having a serious erosion hazard with slopes ranging from zero to seven percent.
- h. Less than 10 percent of the surface layer in these soils consists of rock fragments coarser than three inches. These soils present no particular difficulty in cultivating with large equipment.
- i. Land having the potential of being made prime for agriculture through economically justifiable investments and farming practices.

Criteria for Unique Agricultural Land:

- a. It is used for a specific high-value food or fiber crop.
- b. It has a moisture supply that is adequate for the specific crop. The supply is from stored moisture, precipitation, or a developed irrigation system.
- c. It combines favorable factors of soil quality, growing season, temperature, humidity, air drainage, evaluation, aspect, or other conditions, such as nearness to market, that favor the growth of a specific food or fiber crop.

Criteria for Agricultural Lands of Statewide Importance:

- a. The soils have an adequate moisture supply sufficient to permit economic crop production in five out of

ten years with the amount of water available for plant growth from moisture stored in the soil plus precipitation during the plant growth period or more than 11 inches.

- b. The soils at a depth of 20 inches have a mean summer temperature about 59^o F.
- c. The soils are neither too acidic not too alkaline with a pH between 4.5 and 8.6 above a depth of 20 inches.
- d. The soils are not flooded frequently (less often than once in two years) and are well drained with a water table that doesn't prevent the production of food, feed, fiber and forage crops.
- e. The soils do not suffer from erosion hazards having moderate slopes.

Criteria for Agricultural Lands of Local Importance:

- a. Lands that meet the definitions set forth for prime or unique agricultural land.
- b. Lands needed to maintain a viable agricultural economy including its related agribusiness and services.
- c. Undeveloped land areas well suited for long term economic production of agricultural commodities by virtue of soil conditions and location.
- d. Agricultural lands considered essential for the protecting of soil, air and water resources.

VITA

Gail Easley was born in Dyersburg, Tennessee, on October 27, 1946. After spending her early years in East Tennessee, she moved to St. Petersburg, Florida, where she graduated from Boca Ciega High School in June, 1964. She entered the University of Florida in Gainesville in September, 1964. Her major was Public Administration and she received her Bachelor of Arts degree in June, 1977. Ms. Easley then entered the Graduate School of Planning at the University of Tennessee in Knoxville. She received her Master of Science in Planning in June, 1979.

Ms. Easley worked as Staff Assistant in the Food and Resource Economics Department at the University of Florida. Her primary responsibility was financial planning and management. She later worked as a Research Associate in the same department with major emphasis on communication theory and techniques with small farmers. During her studies at the Graduate School of Planning she held a Graduate Assistantship with major responsibility in research on establishing community goals for Knoxville/Knox County.

Ms. Easley is married to William L. Farrell. They have three children, Denise, John, and David.