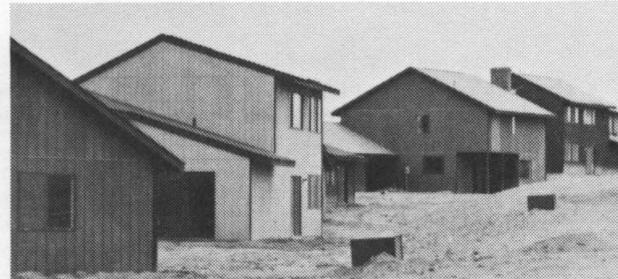
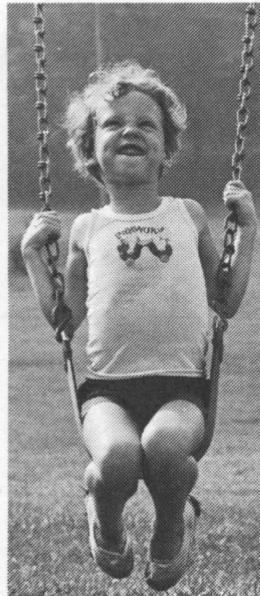


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PROTECTING AND PRESERVING RURAL LAND USES:
ISSUES, PROBLEMS, INSTITUTIONS

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PROCEEDINGS OF A CONFERENCE

EXTENSION DIVISION, VIRGINIA POLYTECHNIC INSTITUTE
AND STATE UNIVERSITY, AND



VIRGINIA WATER RESOURCES RESEARCH CENTER.
MB 296, SEPTEMBER 1982

This is the fourth in a series of publications containing the proceedings of biennial conferences on the issues and problems associated with land and water resources within the Commonwealth of Virginia.

The first publication in this series is dated November 1974 and identified as Publication 629. The second is dated February 1977 and identified as Publication 727. The third is dated September 1979 and identified as M. B. 276.

PROTECTING AND PRESERVING RURAL LAND USES: ISSUES, PROBLEMS, INSTITUTIONS

PROCEEDINGS OF A CONFERENCE

Edited by

J. Paxton Marshall and Waldon R. Kerns

MB 296

September 1982

Extension Division

and

Virginia Water Resources Research Center

Virginia Polytechnic Institute and State University

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Abstract

A Conference on Protecting and Preserving Rural Land Use in Virginia produced twelve papers, ten devoted to land-use policy and two to water policy. For the proceedings, the papers are presented in four subsets: land-use issues, case studies and methods, and water policy. The available supply of cropland, the impact of an expanding metropolis on an urban-fringe locality, and the way changes in culture impact land are discussed as issues. The case studies examine the transferable development rights program of Calvert County, Maryland; the development rights purchase program of Suffolk County, New York; and the development of differential taxation and tax-relief programs by states. Among the methods examined are zoning, transferable development rights, purchases of development rights, and timing and placement of utilities. The problems of changing water law from the Riparian Rights Doctrine to an alternative system and of implementing areawide water quality programs are discussed.

Keywords: Land, land-use policy, agricultural land, development rights, differential taxation, riparian rights doctrine, water quality, Virginia water policy.

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PREFACE

The protection and preservation of rural lands has become a major issue for debate at all levels of decisionmaking from federal bureaucracies to the smallest units of government. The debates focus on the appropriate level of protection for rural lands and the desirability of preserving certain lands such as prime agricultural lands. Of course, decisions to protect and preserve such land bring forth the complex issues of selecting the most appropriate institutional mechanisms for accomplishing the stated goals and objectives

The Conference on Protecting and Preserving Rural Land Uses was conducted in cooperation with the University of Virginia Tayloe Murphy Institute and the Piedmont Environmental Council. The objective of the conference was to enable participants to learn the differences among the primary public means of protecting and retaining land in rural uses, in particular agricultural and forestal uses. These proceedings further the purpose of the conference; namely, to provide interested persons an opportunity to learn about the differing land-protecting and -retaining institutions. Twelve papers prepared for the conference are presented in these proceedings in four subsets: land-use issues, case studies and methods, and water policy.

Land-use issues are the focus of papers by Plaut, Patterson, and Elwood. Plaut examines preservation of agricultural land as a problem having social-economic-political dimensions. He probes the causes of land conversion, the concepts of quality of land, and the impacts of preserving land for extensive uses. Patterson discusses the impact of national agricultural policy and an expanding metropolitan center upon a specific jurisdiction, the County of Fauquier, Virginia. "As the Ambassador of Literature," Elwood sketches the universals, giving special attention to the evolution of cultures and illustrates the impact each culture--the communal, sacred, secular, and industrial--has had and is having upon land-use decisions and land settlement patterns.

Institutions designed to effect changes in uses of land are examined as case studies in the papers by Bowen, Newton, and Marshall. These papers show how differing institutional

arrangements affect land, landowners, localities, and the public. Bowen describes the rules and procedures applicable to a transferable development rights program adopted by the governing board of Calvert County, Maryland. Relatively new at the time of the conference, December 1979, this program had attracted few participants. This contrasts sharply with the development rights purchase program Bowen describes from the perspective of a participant in and witness to its life cycle. From the paper by Marshall, the reader will learn how the states developed, modified, and adopted institutions designed to protect farmland, initiating with differential taxation in Maryland in 1956 and extending to tax-relief in Wisconsin in 1977.

Special attention is devoted by Buttleman, Pizor, White, and Knapp to methods for protecting and retaining land in extensive use. Buttleman argues that zoning offers the most effective method yet devised for achieving publicly-desired land-use objectives. He gives special attention to Virginia law and appends an article describing the Wisconsin program. Density transfer (a form of transferable development right), is an innovative method of protecting agricultural land described by Pizor.

A uniquely-funded development rights purchase program established by the state of Maryland and a similar program approved by referendum by Howard County, Maryland, are described by White. In the remaining paper, Knapp presents an analysis of the relative costs of four widely discussed methods of protecting agricultural and forestal land, use-value taxation, development rights purchase, transferable development rights, and timing and placement of utilities. His analysis provides an essential perspective on both the issues and problems associated with efforts to protect and retain land for agricultural and forestal use.

Land-use decisions and policy are firmly linked to water policy. This is made starkly clear in the papers by Batie et al, and Kerns. The problems presented by changing relationships among private and public rights when making policy appropriate to the use of land as private property and water as a resource held in common are discussed by

Batie et al. These authors center attention upon the problem of changing water-use law from the traditional allocation system, known as the Riparian Rights Doctrine to an alternative system. A different issue is addressed by Kerns. His paper discusses strategies and alternatives for implementing water-quality programs on an areawide basis.

Each issue addressed in these proceedings is a subject receiving attention within the Commonwealth of Virginia. Each individual who reads all or any subset of the

papers contained in these proceedings will further the objective and purpose of the Conference on Protecting and Preserving Rural Land Uses by discussing in conversation and at public forums the institutions described and comparing and contrasting their various impacts and effects.

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PRESERVING RURAL USES OF THE LAND: WHY? WHERE? HOW MUCH? WHO PAYS?

By Thomas R. Plaut#

Since World War II, the shifting distribution of population in the United States has put continuing pressures on rural uses of land. During the 1950s and 1960s, we saw the rapid growth of our metropolitan areas and the rapid decentralization of the population within them. During the 1970s, population decentralization continued, but another trend has become evident--the trend of population deconcentration. Nonmetropolitan areas are now growing faster than metropolitan regions as the population moves to smaller cities and towns, particularly in areas just beyond official metropolitan boundaries (Beale 1977, Vining and Strauss 1977*).

Traditionally, the loss of agricultural land and other rural lands to urbanization has evoked little concern in this country. Clearly, when the government was paying farmers not to grow crops, it was hard to view the urbanization of farmland as a serious problem. In recent years, however, agricultural surpluses have ended in the face of rapidly escalating export demands. This and the possible deleterious effect of high energy prices on future increases in agricultural productivity and yields have led some observers to believe that the continued loss of farmland to urbanization may seriously constrain future increases in agricultural production (Brubaker 1977, Crosson 1977, Pimentel, et al., 1975 and 1976, Schiff 1979).

Besides the role of agricultural land in producing food and fiber, other considerations have led to an increasing concern over the loss of rural land to urbanization. The environmental consciousness of the 1970s has renewed the desire to retain productive open space in areas accessible to the more densely populated areas. The loss of rural land is also often associated with sprawled, leap-

frog development which is deemed to be costly and inefficient by many observers. The general desire to preserve the family farm and farming as a "way of life" in reaction to increasing corporate (and foreign) influence in the agricultural sector is also important.

These concerns have led to increased interest and action in farmland preservation across the country. The earliest and most wide-spread approach was differential assessment of farmland, but many states and localities are now experimenting with much more direct preservation techniques including purchase of development rights, agricultural zoning, and, to a much lesser extent, transferable development rights.

Here, we consider some of the more important questions associated with the preservation of land for farming and other rural uses. First, we detail more carefully the effects of urban expansion on farming and other rural activities. Second, we address, from a national and regional perspective, the question, Why preserve farmland? and review some of the state and local approaches to farmland preservation. Finally, we consider a central question in rural land preservation: Who pays? Is the cost of preservation largely assumed by the public or the private sector?

Effects of Urban Expansion

Urban expansion can have two broad effects on farming and other rural activities. The first, and most direct, effect is the conversion of rural land to urban uses. The second affects farming and includes (1) the idling of farmland in areas under intense urban pressures and, over a wider geographic area, (2) the slow switchover to less capital-intensive forms of farming. These effects are caused by the

*See References, page 5.

#Research Associate, Bureau of Business Research, University of Texas at Austin, Austin, TX 78700 (Bureau Paper Series BP-79-6).

adverse spillovers created by nearby urban development. Typical urban spillovers include the vandalism of crops and equipment and the destruction of livestock by children and pets, the congestion of traffic on local roads which can make it difficult for farmers to move around with their slow-moving equipment, the regulation by suburban communities of such routine farm activities as spraying of pesticides and herbicides and the spreading of lime and manure, high property taxes and special service levies on agricultural land, and high land prices which make it difficult for existing farmers to expand and new farmers to locate in the area (Coughlin, Berry, et al., 1977, pp. 50-58).

Urban spillovers increase the cost of carrying out agricultural activities, and, because of this and the general expectation of future development, farmers in urbanizing areas often begin gradually disinvesting in agricultural production. Very strong urban pressures may result in an "impermanence syndrome", a general feeling that the future of farming in the area is doomed, and, in this case, farmers may stop agricultural production altogether and otherwise productive farmland may be permanently idled (Blueprint Commission on the Future of New Jersey Agriculture, 1973). For example, from a study of two rapidly-urbanizing areas in the Philadelphia and Minneapolis-Saint Paul metropolitan areas, it was estimated that an additional one-half to one acre of cropland was idled for every acre converted to urban uses (Plaut 1978, pp. 176-180).

Besides the idling of farmland in areas under extreme urban pressures, agricultural disinvestment in response to urban spillovers can result in a more widespread effect--the slow switchover from those types of farming requiring relatively large and long-term capital investments to other types of farming requiring shorter planning horizons. The latter effect is especially true for dairying (Berry 1978 and 1979).

Thus, the effect of urban expansion on rural activities goes far beyond the conversion of land to urban uses. Measuring the loss of agricultural production caused by urban spillovers may be difficult, but this loss is important and should not be ignored.

Why Preserve Farmland?

National Considerations--From a national perspective, we are concerned about the loss of farmland to urbanization because it may interfere with our ability to increase agricultural production in the future. The urbanization of farmland is largely irreversible because of the high costs associated with reconverting land back from urban to agricultural. With high export demands, high energy prices and shortages, and a slowdown in the growth of agricultural productivity and yields, it is highly likely that it will be necessary to increase the agricultural land base in the future. To do this, however, it is necessary to replace that land lost to urbanization plus bring some nonfarmed land into production.

Current estimates indicate that the loss of farmland and other rural land to urban uses is proceeding at a fairly rapid rate (table 1, page 6) (See footnote, page 5). Still, when we project these losses out to the year 2000, it is estimated that only 3 percent to 7 percent of the current stock of all rural land, farmland, cropland, or prime agricultural land will be lost to urbanization over the period.

Instead of comparing the loss of farmland to the current stock, it may be more relevant to relate the loss to the reserve--land currently not being farmed but which can be brought into agricultural production at a reasonable cost. Such a comparison views the urbanization of farmland as reducing our "margin of safety" if it is necessary to expand the agricultural land base in the future.

Recent studies by the Soil Conservation Service (1979) have identified 135-million acres of noncropped land with a high-to-medium potential for conversion to cropland (based on 1976 commodity prices and development costs). Of this total, 47-million acres is prime. Projecting current losses out to the year 2000 indicates that the urbanization of farmland could significantly reduce the current reserve--losses may equal over 10 percent of the current cropland reserve and almost one-half the prime agricultural land currently available in reserve.

Whether or not the urbanization of farmland is of national concern critically depends on whether it will be necessary to expand the agricultural land base in the future, and, if so, by how much. A recent analysis by the author found that a continuation of the high demand and low productivity and yield trends of the 1970s may make it necessary to expand the existing cropland base by as much as 154-million acres by the year 2000 (Plaut 1980). In this case, the continuing loss of farmland to urbanization is clearly a national problem and vigorous farmland preservation programs are justified. On the other hand, if we return to the low demand and high productivity and yield trends of the 1960s, it may be possible to retire a large portion of our present cropland base from production by the year 2000 (as much as 159 million acres, Plaut 1980). Under these conditions, the loss of farmland to urbanization is probably not of national concern.

Present indications are that high demand and low productivity and yield trends will continue and it will be necessary to expand the current cropland base at least somewhat in the future. We should be concerned about the loss of farmland to urbanization because it only serves to exacerbate a possible land-shortage problem in the future.

Regional Considerations and Preservation Approaches--Given that the urbanization of farmland has serious national implications, then we should be especially concerned about farmland losses in those regions where the conflict among urbanization and productive agricultural land is especially strong. For example, table 2, page 7, shows that almost two-thirds of the prime land urbanized from 1967 to 1975 was in four regions lying largely east of the Mississippi--the Northeast, the Corn Belt, the Appalachian, and the Southeast farm production regions. Together, these regions contained only 42 percent of the nation's prime land in 1967 (Dideriksen, Hidlebaugh and Schmude 1977).

Nationally, prime agricultural land is about one-and-a-half times more likely than all rural land to be converted to urban uses. This bias is especially strong in the Northeast, the Southeast, the Delta States, and the Mountain and Pacific farm production regions. The bias of urbanization toward prime agricultural land in the Northeast and West can be largely explained, perhaps, by the close proximity of cities and productive agricultural land in valleys and along the coast. Also, the relatively rough terrain makes flat, prime agricultural land very

attractive for building sites. In the West, prime agricultural land is even more attractive to developers because of the availability of water (in arid areas, prime agricultural land is almost always irrigated). The bias of urbanization toward prime agricultural land in the South is a bit more mysterious, but perhaps the flat, well-drained nature of the land makes it very attractive for development purposes.

The strong bias of urbanization toward prime agricultural land may explain much of the interest in farmland preservation in the northeastern and western parts of the country. Massachusetts, Connecticut, New Jersey, and Suffolk County, New York, are all pursuing purchase of development rights programs, and Maryland has passed legislation to allow such a program (Coughlin and Plaut 1978). One western state, Oregon, now has a relatively strong statewide zoning program and for some time, California has been considering such a program, focused primarily on prime agricultural land. Several California counties have agricultural zoning ordinances, as do Frederick County, Maryland and Heidelberg Township, Pennsylvania (Berry, Coughlin, et al., 1977, pp. 182-209; and Plaut 1978, pp. 419-450). In the South where development is also strongly biased toward prime agricultural land, there has been relatively little interest in farmland preservation.

In the Midwest (the Corn Belt and Lake States farm production regions), urbanization is not particularly biased toward prime agricultural land, but since this region contains so much, 34 percent, of the nation's prime land, one-quarter of the national urbanization of prime land occurred in this region. However, except for a relatively innovative program in Wisconsin (Barrows and Yanggen 1978) and agricultural zoning ordinances in a few Iowa counties, interest in farmland preservation has been largely lacking in this region.

Clearly, the preservation of farmland for its productive value is not the only motive behind the farmland preservation programs mentioned above. In general, interest in containing sprawl, in protecting open space, and in preserving the rural character of the community is a more dominant motive for farmland preservation in the Northeast while the protection of the agricultural economy and the preservation of farmland for its value in producing food and fiber is a more important motive in the Midwest and West.

Preservation Techniques: Who Pays?

Preserving farm and other rural land from urban encroachment raises a central question: Who pays the cost of preservation? Two quite different approaches to farmland preservation illustrate the importance of this factor. In the purchase-of-development-rights approach, the government buys from the landowner the right to develop his land. The cost of this right is the difference between the market value and the current use value of the land, such as its value for purely agricultural purposes. Here, the cost of preservation is clearly borne by the public. Agricultural zoning, on the other hand, restricts the landowner to using his land only in its current use. Under this approach, the cost of preservation--again the difference between the market value and the use value of the land--is largely borne by private landowners.

Cost considerations pay a very important part in determining what types of farmland preservation programs are implemented. There are, of course, strong pressures on the public sector, particularly state and local governments, to hold down spending. However, despite the possible high costs, most state and local governments in the Northeast have chosen the purchase of development rights as the most practical approach to farmland preservation. This is because of a strong private tradition in land ownership and the fear of legal challenges of taking associated with regulatory approaches to preserving farmland.

The cost of using development rights to preserve farmland and other rural uses can indeed be quite high. In areas under strong development pressures, for example, development rights can cost up to 80 percent of the market value of the land (Boyce, Kohlhase, and Plaut 1978). In the Suffolk County (New York) farmland preservation program, development rights were costing \$2,900 to \$3,200 per acre in 1977, and in a

demonstration program in New Jersey (Burlington County, 30 miles from Philadelphia), the cost of development rights was appraised at about \$2,400 per acre (Coughlin and Plaut 1978). Original plans in New Jersey were to use the public purchase of development rights to preserve one-million acres of prime farmland throughout the state, but because of the obvious high costs of such a program, support for this approach has dwindled.

Agricultural zoning, on the other hand, is not without its costs. Because it strongly restricts the landowner's right to develop, agricultural zoning is vigorously resisted by the affected landowners. Still, agricultural zoning is being used with some success in a few states and counties in the Midwest and West, possibly because much of government's regulatory power has been retained at the state and county level rather than being dispersed to localities as in the Northeast.

The greatest impediment to using agricultural zoning to control land use has involved its legality, particularly the taking issue. The taking clause of the Federal Constitution prohibits the taking of private property for public purposes without just compensation. What exactly constitutes a taking has never been clearly defined, and most court cases involving regulation and the taking issue are decided on their individual merits. Bosselman, Callies, and Banta (1973) have noted that the "taking myth", on the feeling that landowners must be compensated for any sort of restrictive regulations, has kept many local governments from using strong regulatory approaches to controlling land use. However, in the case of agricultural zoning, it appears that the public benefits of such regulation may outweigh the private costs (the balancing test set forth by Justice Oliver Wendell Holmes) and that such regulation would be held as a valid exercise of the police power by the courts (Plaut 1978, pp. 389-399).

Footnote

1. The estimates were obtained by averaging the estimates of the annual urbanization of all rural land from Dideriksen, Hidlebaugh, and Schmude (1977), 2.1 million acres, and the Soil Conservation Service (1979), 2.9 million acres, and by assuming that the proportion of land urbanized in each category was the same as reported by Dideriksen, et al. For more details, see Plaut (1980).

References

- Barrows, R., and D. Yanggen, "The Wisconsin Farmland Preservation Program", Journal of Soil and Water Conservation 33(1978):209-212.
- Beale, C., "The Recent Shift of United States Population to Nonmetropolitan Areas", 1970-1975, International Regional Science Review 2(1977):113-122.
- Berry, D., "Effects of Urbanization on Agricultural Activities", Growth and Change 9(1978):2-8.
- Berry, D., "The Sensitivity of Dairying to Urbanization: A Study of Northeastern Illinois," The Professional Geographer 31(1979):170-176.
- Blueprint Commission on the Future of New Jersey Agriculture, Report, Trenton, 1973.
- Bosselman, F., D. Callies, and J. Banta, The Taking Issue, prepared for the Council on Environmental Quality, Washington: Government Printing Office, 1973.
- Boyce, D. E., J. Kohlhase, and T. Plaut, "The Development of a Planning-oriented Method for Estimating the Value of Development Easements on Agricultural Land", Regional Science Research Institute Discussion Paper Series No. 105, Philadelphia, 1978.
- Brubaker, S., "Land--The Far Horizon", American Journal of Agricultural Economics 59(1979):1037-1044.
- Coughlin, R. E., and D. Berry, et al., Saving the Garden: The Preservation of Farmland and Other Environmentally Valuable Landscapes, Report to the National Science Foundation (Research Applied to National Needs) by the Regional Science Research Institute, Philadelphia, 1977.
- Coughlin, R. E., and T. Plaut, "Less-than-fee Acquisition for the Preservation of Open Space: Does it Work?", Journal of the American Institute of Planners 44(1978):452-462.
- Crosson, P., "Demands for Food and Fiber: Implications for Land Use in the United States", in Soil Conservation Service of America Special Publication No. 22, Land Use: Tough Choices for Today's World, Ankeny, Iowa, 1977.
- Dideriksen, R. I., A. R. Hidlebaugh, and K. O. Schmude, Potential Cropland Study, Statistical Bulletin No. 578, Washington: Soil Conservation Service, U.S. Department of Agriculture, 1977.
- Pimentel, D., W. Dritschilo, J. Krummel, and J. Kutzman, "Energy and Land Constraints in Food Protein Production", Science 190(1975):754-761.
- Pimentel, D., E. C. Terhune, R. Dyson-Hudson, et al., "Land Degradation: Effects on Food and Energy Resources", Science 194(1976):149-155.
- Plaut, T., Urban Growth and Agricultural Decline: Problems and Policies, unpublished Ph.D. Dissertation, University of Pennsylvania, 1978.
- Plaut, T., "Urban Expansion and the Loss of Farmland in the United States: Implications for the Future", American Journal of Agricultural Economics 62(1980):537-542.
- Schiff, S. D., "Land and Food: Dilemmas in Protecting the Resource Base", Journal of Soil and Water Conservation 34(1979):54-59.
- Soil Conservation Service, U.S. Department of Agriculture, National Summaries of the 1977 National Resource Inventories, Washington, 1979.
- Vining, D. R., and A. Strauss, "A Demonstration that the Current Deconcentration of the Population in the United States is a Clear Break with the Past", Environment and Planning 9(1977):751-758.

Table 1.--Projected urbanization of rural lands from 1977 to 2000, assuming the continuation of present trends

Land use	a	b	c	d	e
	Stock	Converted	Converted	Reserve	Converted
	In 1977	per year	1977-2000 (b/a)	In 1977	1977-2000 (b/d)
	--1,000s of acres--		Percent	1,000s of acres	Percent
All rural land ¹	1,410,000	2,500	4.1	N.A.	N.A.
Farmland ²	955,000	1,200	2.9	N.A.	N.A.
Cropland	413,000	730	4.1	135,000	12.4
Prime agricultural land ³	326,000	910	6.4	47,000	44.5

¹Excludes federally-owned land and Alaska.

²Cropland, pasture, and range.

³SCS Classes I and II.

Sources: Dideriksen, Hidlebaugh, and Schmude (1977) and Soil Conservation Service (1979).

Table 2.--Urbanization of prime agricultural land by farm production region*

Region	a Prime land conversion per year, 1967-1975 1,000s of acres	b Percentage of rural land converted prime, 1967-1975 -----Percent-----	c Percentage of rural land prime in 1967	d Bias (b/c)
Northeast . .	125	35.8	19.0	1.88
Lake States .	55	35.6	37.2	0.96
Corn Belt . .	136	50.7	49.7	1.04
Northern Plains . .	52	47.7	37.0	1.29
Appalachian .	80	29.4	23.5	1.17
Southeast . .	145	44.2	20.9	2.12
Delta States	52	51.8	26.2	1.98
Southern Plains . .	44	30.0	22.0	1.36
Mountain . .	14	8.9	5.5	1.62
Pacific . . .	50	30.6	10.4	2.94
Total contig. U.S.	753	36.7	23.9	1.54

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

Source: Dideriksen, Hidlebaugh and Schmude (1977).

INVOLVING FARMERS AND THE PUBLIC IN PROTECTING FARMLAND

By Don Patterson#

From having worked with farmers as much as I have, I realize that it is very difficult to get farmers to leave the farm long enough to pay serious attention to either the politics of their profession or their marketing. In a sense, we can be grateful to them for that, because no other sector of the American economy has worked as hard and effectively at increasing its productivity as agriculture has over recent years.

Farmers have given us our food and fiber for a declining share of the consumer dollar, down from about 22 percent in the years after the second World War, to about 16 percent now. This improvement has resulted directly from increases in farm productivity. Throughout this thirty-five year period, the middleman's portion of the consumer dollar as well as farm costs of production have been rising. As a result, farmers have had to increase productivity fast enough to offset processing, marketing and other increases to maintain the relative trend. And yet, continually, farmers are scape-goated for food price increases they have not caused. The statement of one simple fact drives home this point all by itself: in 1948, farmers received more in actual dollars per unit for the whole range of farm commodities than they did in 1978 while food prices in 1948 were only a fraction of what they were last year.

Farmers have stayed on the farm, producing more and more, until now, inflationary increases in production costs have brought them to the point where farming is a daylight to dark proposition just to stay in business. They have to put in more and more hours of work--farming more land and roiling the iron longer into the night--just for the privilege of continuing an increasingly vain effort to earn a marginal income in the face of inflationary production cost pressures.

Under these circumstances, very few working farmers feel that they can take time away from their operations to get involved in

public policy issues, except perhaps in the winter. And yet, as the pressures build, farmers have had to speak out more strongly on policy issues if only to protest their present position as shock absorber at the bottom of the economic system.

In spite of the time and money pressures (and do not ever think that it does not cost money to spend time lobbying in Washington and Richmond), more and more farmers have begun to crave out the time necessary to pay increased attention to the actions of their government officials. Slowly, during the last few years of agricultural hardship, they have come to realize that the people they thought were watching out for their interests have, in fact, not done so. Slowly, they have begun to learn that nobody is going to mind the store for them. More and more are learning that the system runs at their expense if they do not speak out and get involved to make sure that their interests are protected.

Everyone's Issue

In my mind, the battle to preserve farmland and to protect the farm industry is more in the interest of consumers and the nation as a whole, than it is simply a struggle to protect farmers. Everyone should be working on this issue, but unfortunately, too many Americans still do not understand it. Farmers have had to squeeze time out to get involved with the politics of agriculture--they have had to come off the farm to help do the required political job--simply because they are the only ones who understand the price that the nation will pay if somebody does not see that policy changes are made.

How many people here are farmers? (Over half of the audience raised hands). And how many of you that have raised your hands would say that eighty or ninety percent of your income is derived from farming? (Fewer

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hands). Unfortunately, this becomes an important distinction. Increasingly, one of the big problems in the structure of agriculture is that more and more owners of agricultural land are earning a major portion of their living from non-farm sources. Doctors, lawyers, and others with cash flow from non-farm income are getting into agriculture either because they prefer to live in the country or because they want to diversify their investment portfolio by holding an increased amount of land. As many of you are aware, investment in land has generally been a good means of hedging against inflation. In recent years, land has risen in value in line with or faster than overall inflationary trends. They are not making any more of it

Farmland ownership is becoming increasingly concentrated in the hands of people who are not the most efficient food producers, but more on this later.

The Issues in Fauquier County. I want to talk to you about my own experience since I came back home from Montana to Virginia in 1975, upon the death of my father. I want to describe in a narrative way how I progressed through a number of activities to the position I hold now as State Coordinator of the American Agriculture Movement in Virginia. The story will be autobiographical; as a result, it may seem as if I am the center of everything. I have not been; many people must become involved to accomplish the important work of changing the local political climate in response to changing conditions. Many people must speak out to change the thinking of county supervisors and to obtain necessary legislative action from state and federal government.

One cannot underestimate the amount of sacrifice and the amount of time that must be spent by many people if increased public awareness of the farmland issues is to be achieved. Attendance at public meetings writing letters to editors, talking to officials, becoming informed on the political issues, speaking to civic groups, testifying at public hearings, carrying petitions door to door, talking to neighbors, raising money to hire staff support, sending out newsletters are all among the jobs that must be handled.

The construction of Interstate Highway 66 through Fauquier County was one of the concerns that had people wringing their hands when I returned home to The Plains in 1975. People were worried about the growth implications of the interchanges that were to be built as part of this road. For a variety of reasons that I am sure I do not have to rehearse before this group, some of us

doubted the wisdom of continued suburban sprawl outward in a larger and larger arc around the Washington, D.C. metropolitan area.

One particular interchange more than the others seemed to us to be undesirable from the standpoint of protecting a prime environmental and agricultural area in our county. This interchange would have opened up to subdivision development an area on the western side of the Bull Run Mountains that has been designated by the state as one of Virginia's prime environmental areas deserving of protection.

Those of us who have worked on the issue believe that this particular interchange would have benefited mostly only a few landowners who appeared to have been acquiring speculative holdings with the intention of building subdivisions when the opportune moment arrived.

The interchange issue plus a battle over the revision of the County's comprehensive plan were the major issues affecting the preservation of farmland when I returned home to Fauquier.

Every New Resident Costs. With me from Montana, I brought a great deal of experience with the kinds of growth issues that Fauquier was facing. I had worked in state government and as a member of the research faculty at Montana State University directly and immediately with the problems of population growth management. While I was particularly involved with the growth problems associated with large scale energy development in the western states, I was fully conversant with the recent national research literature on growth management, and I understood both the tax burdens and the public service costs that result from highway related suburban growth. I knew that most new residents in a county like ours cost each existing resident more in taxes. Only the quite wealthy usually establish a large enough tax base to cover the County's per capita public service costs.

Contrary to the mythology which had been spread in the County at the time suggesting that every new resident helps to share a fixed tax burden, thus serving to lower everyone's taxes, we were actually facing the opposite situation. Study after study now shows diseconomies of scale in the delivery of public services. Most new residents do not actually pay enough in taxes to cover the cost of the services that they and the members of their families require. Similarly, most new businesses that generate new population growth do not bring in a large enough increase in the tax base to pay the cost of new public services that their new resident/workers must have.

This was a startling fact to inject into the political environment of Fauquier County of 1976. The dominant political coalition in Fauquier at the time consisted of people who believed that progress lay in our becoming part of the growing Washington Metropolitan area.

My lifetime in my home community of The Plains offers an example of the predominant thinking. People in The Plains have been waiting all my life for some event like the construction of the interstate highway to bring progress to our town.

Coupled with this attitude was a mentality among working farmers that it never would be possible to earn a living from farming. Farming was thought of as something to do until the time arrived to sell out to land developers or someone else rich enough to buy today's high priced farmland. The capital gain on the increase in land values was seen as the only way many farmers could make good on a lifetime in farming that had not paid its way. Few people had any idea that it could be any other way. Tragically, few people had any idea how federal government policy has served to create this up side down situation.

The Character of Northern Fauquier. The northern part of Fauquier County where I live (unlike the western and southern parts of the County) no longer has many working farmers left. The dominant land owning group is composed of horse breeders and others with independent non-agricultural income who have settled in the area over recent years in part because of what land planners sometimes refer to as "high amenity value." These people have been working for many years to protect the character of their area (partly to preserve open space for foxhunting). However, they had shown little ability to build effective political coalitions which could succeed in changing the politics of the County. Instead, they have tended to work in isolation within their own area, promoting scenic and conservation easement programs and futilely believing that they could accomplish their farmland preservation goals alone.

Much of the time, the viewpoints of northern Fauquier landowners have been overruled by the County's elected officials who had attempted to secure themselves politically by establishing themselves with broader numerical constituencies. Very simply, while the residents of northern Fauquier have wanted to see agriculture preserved in the County, they have not been able to identify and work with other groups in the County to establish a common cause and a common front.

This was the situation as we began the

I-66 Interchange battle. Even after I was elected president of the landowners association that represents northern Fauquier, it remained very difficult to bring this group to recognize what had to be done to become politically effective. Very few northern Fauquier landowners had demonstrated the commitment and the understanding to work together with others establishing areas of agreement and building common cause. The building of political coalitions takes a substantial steadfastness, political sophistication, maturity and ability to conceptually understand the attitudes of others whose circumstances are different.

New Suburban Residents and Their Concerns

Over the years, as concern about land-use issues has been developing in Fauquier, people from Fairfax county and points east have been moving into the County. Most of these new arrivals were seeking to get away from what they were leaving behind. Taxes were rising in the suburban areas to the east, and the new Fauquier residents arriving from there did not want to create in Fauquier the same situation that they were escaping in Fairfax. Some of these new residents have exhibited what economist Kenneth Boulding has called "the last settler syndrome": "Now that I am in, shut the door." From the standpoint of civil liberties, this is an awkward viewpoint to be associated with, but it is a reality that must be worked with, and so work with it we have.

Those of us who have been concerned about the farmland issue were willing to gain support wherever we could, because in the final analysis, we believed and still believe that a policy of more cautious growth serves the best interests of not only the vast majority of county residents but also of the metropolitan area and the nation. We set about reaching the newer, smaller-lot residents and focusing their attention on the issues so that they could make up their own minds whether they agreed with us or not.

Not only were we recognizing the kind of county that the vast majority of Fauquier citizens would want in the years ahead, we were also recognizing the importance of a great range of supporting priorities such as the need to preserve watershed at the headwaters of the streams that provide water for the metropolitan population centers. We were trying to increase public policy recognition of the now unfolding prospect that rising fuel and related transportation costs would make it desirable to serve metropolitan food markets from more local farming areas. We were trying to exhibit the vision to recognize that importing vegetables

from California, Mexico, and Florida would soon become an increasingly uneconomical proposition.

World Population and Food Production.

On another plane, not the least among the considerations was the awareness that population worldwide is growing at a rate which will result in a doubling of the world's present population shortly after the turn of the century. This is a staggering aspect of the whole matter. It has taken us the entire history of mankind to learn how to produce enough food to feed the four billion people in the world today. In another 25 years, if current population growth rates continue, we are going to have to feed a doubled world population with nothing other than starvation, pestilence, and warfare offering to intercede to alter these dire population projections. Certainly neither international population control policies and techniques nor improvements in agricultural methodology stand ready to succinctly place their thumb in the dike.

And yet, in spite of the seeming inexorability of this situation, we are today building subdivision developments on some of our best agricultural land in the United States. Prime agricultural land is being lost to other land uses at the rate of 8,000 acres per day (three million acres per year,) according to testimony given before the House Agriculture Committee by Neil Sampson, Executive Vice-President of the National Association of Conservation Districts.

Some people in Fauquier county have promoted the idea that agriculture has no future in areas like ours. In fact, the only problem that agriculture has in Fauquier county is that federal policy has been managed so that the agricultural economy is a step child of our economic system. We can be much more productive agriculturally in Fauquier than the areas in the midwest that are thought of as the breadbasket of the world. With natural rainfall, we can produce a per acre annual gross five times greater than dry land farms in the midwest. One farm in Fauquier, that happens to be owned by a man that has been prominent in bringing court action to break zoning codes in northern Virginia, has been the national prize winning farm from a standpoint of corn production yields.

As a matter of the highest national priority, we have been trying to focus the attention of our county citizens on the importance of these values for the longer term health and strength of our country. Further, we have addressed the need to make the economies of our small towns and rural counties throughout the United States healthy

and strong so that these areas do not have to look forward to becoming part of some larger metropolitan and profitable role in the American system.

The Local Political Fallout.

Inevitably, the evolution of thinking about what is right for the future of our county has put us on a collision course with a primary traditional tenet regarding the right of individuals to do what they want with their own land. Farmers have been strongly identified with the need to retain this "right" as long as the building of housing or the selling of their land to real estate developers was the only way that they could have anything to show for a lifetime spent in agriculture. If you can't make a living from farming, you don't want to put yourself in the situation where somebody is going to take away the value of your farmland.

Until policy management has been corrected so that it is possible for farmers to make a fair living from their labor just as other producers in our economy do and until all property owners share as fairly as possible in any austerity they democratically decide to inflict upon themselves, we are not in a good position to bring justice in the establishment of land use restrictions governing farmland.

Anybody who fairly understands national economic policy management realizes that for years and years we have been confiscating the fair value of farmers' labor, transferring it over to other sectors of our economy through one or another policy mechanisms. Knowing this, some Fauquier farmers are now saying that if they were given a fair opportunity to make a reasonable return on their labor and investment in agriculture, they would sign a stipulative covenant that their land never be taken out of agriculture. These people understand the importance of wise policy protecting our long term capability to produce food. They also understand enough about federal agricultural policy to realize that farming is a rigged game.

The American Agriculture Movement. Soon after we completed and won the battle to stop the interchange on Interstate Highway 66, there arrived in the County the American Agriculture Movement, a grass roots movement of farmers that began in southeastern Colorado in the fall of 1977 and spread across the country like a prairie fire in two months' time. The Movement has been perhaps most notable for increasing public awareness of agricultural concerns and creating the touchstone for increased farmer attention to the impacts of national agricultural policy.

In the past, the vast majority of farmers simply accepted the results of policy as "the way things had to be." Now, at least some are committed to the idea that nothing will change for the better at a time when government power over agricultural welfare is both insidious and almost infinite unless somebody is speaking out against the bad and proposing improvements.

A growing group of farmers is now increasing their understanding of how policy has been managed, by whom and for whose benefit, instead of just accepting the current reality as the way things have to be. The new mood includes the realization that family farms simply cannot go on getting bigger and bigger, expanding their productivity in order to squeeze out an income from larger volume as the margin between production cost and sale price, even in good years, continues to decline.

Farmers are increasingly beginning to realize that there is a limit to the amount that a family operation can go on expanding production, increasing capital investment, adding more and more fertilizer and chemicals to offset increases in production costs by raising productivity evermore. As the recent nationwide hearings held by the Secretary of Agriculture show, more and more farmers are concluding that federal policies which maintain low farm-commodity prices will have to change if America's family farm producers are to be preserved. It has taken 25 years of an ever tightening noose for farmers to reach this conclusion--25 years during which time family farms have been going out of business at an average rate of 2,000 per week.

Also, as someone mentioned yesterday, we cannot expect to have the climatic cooperation in expanding production that we have enjoyed in recent years. The North American weather cycle in recent years has been very favorable to expanding output, but in the longer span of history such beneficent weather has not been the rule.

The Need for Balance in Our Economic System

The question is this: What are we going to do to put income back into agriculture?

If we had not imbalanced our system, favoring the urban economy over the rural economy, we might not be meeting here today. If the rural and agricultural economies were healthy, we might not have to harass ourselves so much about "use-value taxation," "transfer of development rights," "purchase of development rights, and all these schemes which are designed to adjust for the fact

that we have created an artificial imbalance in the first place. If farmers could make a living in farming, they wouldn't want to sell their farmland. They would rather produce on it, but because they cannot compete successfully with the realizable investment yields achieved in other economic sectors, we have to establish counterbalancing policy artifice to overcome what other policy has created.

For years now, agricultural policy has been managed to maintain a steady flow of cheap food, cheap fiber resources and cheap labor out of rural America into our cities and industrial centers to keep the urban economy and the engine of industry turning. The business of America has been industrially based business. Agriculture has been made a sacrificial lamb to the nation's industrial priorities. This situation might not be so bad if a few million farmers were the only losers. The problem is that we are all becoming losers--and because that is so, we all need to wake up to what is happening.

Many farmers have, even themselves, lost track of what fair income for agriculture ought to be. Too many farmers do not seem to even expect to be paid for their own labor, let alone receive a return on their investment at a level which other enterprises would consider essential to stay in business.

If you are interested in looking into this issue further, there are a variety of worthy references, but one book entitled "George N. Peek and the Fight for Farm Parity," written by agricultural historian Gilbert Fite and published by the University of Oklahoma Press, is particularly interesting. This book goes into the history of the effort to restore balance between the rural and urban economy both before and after the Great Depression. The struggle goes back to those years, and one could earnestly contend that the nation would not be in the economic difficulty it now is if we had had the wisdom to be constantly vigilant in maintaining that balance between the sectors throughout the intervening decades.

Anticipating A Repeat of 1929. In 1977, viewing the disastrous agricultural situation in Virginia and across the country that year, the more historically reflective among us saw parallels between the late twenties and the late seventies. I became involved with the issue because I realized that it was not just going to be farmers that suffered from the shortsighted management, but that all Americans and even a great many around the world would suffer. Indeed, many are right now suffering from the economic situation in which we find ourselves.

My academic background is in economics, so I realize that there are institutional differences between the world today and the world of fifty years ago. Things are not apt to happen exactly as they did then, but the implications can be just as serious, and if they weren't so imperceptible, they might get better attention.

After everything else is winnowed out, we get back to one solid basic fact: The family farming system is fundamental to the health and stability of the political and economic system that our forefathers have handed down to us. That ought to be important to us in itself, but if that is not enough, study after study also shows that family farmers are the nation's most efficient food producers. All of the economies of scale which are to be achieved in agriculture can be achieved within the family farm management system. This is the farming system that we all, city dwellers and non-farmers of all kinds, should be fighting to preserve for the sake of our own future food supply.

Concentrating Control over Farmland

Federal tax and investment credit laws enacted to offer incentives which are much valued in other sectors of our economy are inexorably working to destroy family farms and concentrate farm and farmland ownership in the hands of those who have non-farm cash flow based on economic power derived from other economic sectors. The ultimate end to this process is the same kind of control over the farm economy that has been achieved by "shared monopoly" or oligopoly elements in other sectors of our economy.

When sufficient control is achieved, the point is reached when the power of supply and demand in market interaction can be overcome: market prices can then be set at will by dominant traders. We are moving inevitably in that direction. Over half of America's most productive working farmers now farm substantially on leased land that they do not own. Typically, a working farmer leases more land than he owns.

Our income tax laws and investment credit laws give the outside investor with non-farm cash flow a better after tax bottom line than the working family farmer is able to achieve. This, coupled with low commodity price levels tied down to low federally-set commodity loan rates, places farmers in a weak competitive position.

In addition, lower rural real estate taxes create an incentive pushing suburbanization into farm areas that adjoin higher-tax suburbs. And if that is not bad

enough, large corporations, including international conglomerates, have been increasing their investments in agricultural land. The latest to make entry into the field has been large investment trusts financed by labor union and corporate pension funds.

Public policy needs to be carefully reviewed so that we can protect the kind of food producer we need for the future. We simply must reassess tax and investment credit laws that create an artificially better bottom line for corporations and others with wealth enough to buy out working family farms, too often effectively trading efficient food producers for white-elephant tax shelters--and at the same time bidding up the price of farmland beyond what young farmers can afford.

Even Secretary of Agriculture Bob Bergland, who has endorsed policies which are causing the problem we face today, is alarmed enough to have called nationwide hearings on the structure of American agriculture. Even a Secretary who is skilled at turning deaf ears and blind eyes when political expediency dictates, is alarmed to see this nation going increasingly back to a feudal system of agriculture not unlike that which our ancestors came to America to escape.

The Dairy Approach. I grew up on a family farm, and in 1952 my father sold the dairy herd because, in those years, as those of you who were farming then will recall, there began to be a squeeze on dairy producers. We milked thirty head and had to get bigger or get out. My father did not want to commit the uncertain investment to get bigger, and he did not want a larger operation anyway--so he got out. Many other producers did the same, until finally, the producers that remained began to realize that they were going to have to get organized to influence policy if they did not want to eventually hit the skids themselves. The result: dairy cooperatives and political action committees were created to give dairy farmers greater economic and political leverage.

Political action funds were established for the purpose of contributing to the political campaigns of congressmen, senators, presidents, and virtually any politician who acted on legislation of concern to dairy interests. Through this kind of political work, dairy groups sought to protect their income.

Accordingly, dairy farms are protected a little better from the pressures of the current cost/price squeeze than most other commodity groups. Not surprisingly, however,

most of the legislated protections go not to the dairy farmers but to the marketing associations and other bulk handling groups. In other words, the real protection goes to the middlemen with the farmers getting only the "trickle down" that is left over.

As a result, dairy producers are not doing well enough even with their federal programs to cover their production costs the way other businesses would require, but they are at least a little better off, on average, than most other farm groups. Another favored commodity group has been the tobacco producers, mostly because of the influence of the cigarette companies wanting to protect the stability of their raw material supply.

Other commodity groups, particularly the grain producers, have never effectively organized themselves, and thus results the difficulties that so many farmers face. Grain producers are by far the largest commodity group in agriculture. Thus, the state of the grain economy has enormous impact not just on a very large group of farmers, but it also has large influence, both directly and indirectly, throughout the entire economy.

It is unquestionably important for the common good of us all to improve the kit of planning tools available to accomplish land-use planning objectives. We need much more working experience with many of the available alternatives. Also, I would not be true to my state senate campaign if I did not mention the need for more flexible state enabling legislation and relaxation of Dillon Rule restrictions so that alternative approaches can be explored without the existing state imposed constraints. This is fundamental.

Today, we are still using planning tools in rural areas that were originally designed and intended to address the very different circumstances in urban and suburban localities. We still don't have truly appropriate tools to meet the planning needs of rural areas. As planners we have a great deal of work to do in this area, but as citizens of this nation, that is not our main problem.

The Final Governmental Necessity:
Better National Economic Policy. We won't find our way through the problem that faces us today, in my opinion, until we recognize the importance of restoring earning power to the rural food, fiber, and renewable-energy producing sector of our American economy. We cannot have distress in a sector as big as agriculture and expect the national economy to remain sound. When, and only when, we return income to the rural sector will we begin to generate an economic multiplier

which will in turn generate income throughout the entire system creating economic health of the kind that we have not experienced since the last time we experienced agriculturally-grounded economic equilibrium thirty years ago.

We experienced this type of balance in our system during the late 40s and early 50s, and even though there were a number of other factors working in the economy at that time (unleashed post war demand and so forth), the health of the agricultural economy under the entire system prevented the return to economic depression that many expected after the war effort was cranked down.

In those years of healthy agriculture, we experienced the only time since World War II when the nation enjoyed a balanced federal budget. A healthy multiplier from the agricultural and rural foundations of our economy served to generate a strong income tax base. In addition, the nation experienced the lowest inflation rates (once the bubble of pent-up post war demand subsided), the lowest unemployment rates, and the best rates of balanced national economic growth that we have known at any time since.

Unfortunately, much of our economic growth today is of a type that has generated hidden and sometimes not so hidden environmental, social, economic and political externalities as well as insidious diseconomies of scale all of which are coming home to roost in increasing numbers. The results of the type of growth policy we have chosen to pursue will inevitably haunt our economy for years to come.

Instead of continuing to rely on centralized, metropolitanized, corporately conglomerated solutions to all our problems, we need healthy decentralized growth in smaller cities, rural towns, and counties across America. Even though federal policy set in Washington now holds a great deal of power over our lives, ultimately, we need to stop looking to bigger and bigger government to solve all of our problems. We must stop thinking that bigger is always better. Just as we must understand that farms are most efficient when they are relatively small, we must also learn that economies of scale can sometimes be maximized in smaller plants in smaller cities and towns throughout America. We do not have to look to others to solve our problems. We must start looking to ourselves. We can have healthy local independence; we can have communities which work for the benefit of the people living there; we can provide new jobs and we can innovate all at the same time.

The Economics of Scale and the Need for
Grassroots Earned Income

Earned income must be regenerated through our system so that we aren't dependent on federal government transfer payments to make up the difference between what people earn and what they need to earn to survive. We need production functions scaled to true economic efficiencies (with externalities properly considered). We need this pattern of economic development because it is the only pattern that can serve as a foundation for continued national strength and political stability in the years ahead.

We cannot go on concentrating our hopes on larger and larger metropolitan areas that have already shown their inability to function effectively without larger and larger infusions of both local and federal tax dollars. We have seen urban financial failures abounding in New York, Chicago, Washington, and Cleveland. We see similar difficulties in the federal bail-out of large corporations, and yet we go on continuing to repeat and compound our errors for lack of the vision to understand how our system should work and the political courage to do what must be done.

We need to alter policies which tend to reward the achievement of market domination by a declining number of giant firms--firms that, among other things, are becoming increasingly active in the purchase of American farm and forest land. We need a climate of federal and state policy which is favorable to the growth and protection of small business because that is where the greatest amount of innovation and job creation occurs. That is where economic health can come from.

We need an economy that is healthy from the grass roots so that our children and rural residents all across America are not forced to leave home to find employment opportunities in cities that are increasingly unpleasant places to visit let alone live. We need an economic system that is healthy from the bottom, and scaled so we can manage it in smaller, less centralized units.

This is a tall order, but one thing we can do to start to get this job done is to strengthen the position of the family farmer at the bottom of the system, before he

becomes an historical artifact--an important part of our system that we have killed off out of our own ignorance and blindness.

Let us not let this heritage go down the drain. Let us not, in the name of free enterprise and the "right of free market competition" (which is rarely free any more), go on destroying the very competitive relationships that have made this country great. Fundamentally, this is the problem we must address, and if we don't address it none of our carefully constructed artifice for protecting farmland or anything else is finally going to save us.

If we are to have any hope of correcting the present situation, more rural people will have to begin actively informing themselves, making up their own minds what they think is correct and taking whatever political action they feel they can take even if it is nothing more than writing letters to their elected officials. Only if more people start taking an active interest in how policy works and for whose benefit will we work our way out of our present dilemmas.

Last winter, I went to a meeting of the national delegate body of the American Agriculture Movement in Texas. Those assembled were laying plans for carrying their message about the importance of improving U. S. agricultural policy to Washington. To the meeting there came a black sociologist from Atlanta, Georgia. He asked for permission to speak to the group and what he said was very moving:

We, in the cities of America, have lost our way. Don't come to the city and scare use to death; we are already scared to death. We see the nation's energy problems, we see the threat of nuclear war, we see the threat of insufficient food, we see all kinds of enormous problems that we don't know how to solve, but we think that somewhere in rural America there resides, still, the idea of how America is supposed to work. Please come to the city and show us the way. Come lead us and guide us so that we can find our way again.

This is the challenge and the framework of the challenge that we must face together. I hope that we will--before it is too late.

TOWARD A NEW LAND-USE ETHIC

William A. Elwood#

Two years ago, under the sponsorship of the Piedmont Environmental Council and the Virginia Foundation for the Humanities, five of us, representing the fields of Literature, History, Sociology, Economics, and Law were asked to write on what perspectives our disciplines could bring to questions of land use.

A year later, in order to produce a land-use ethic, we added essays from the fields of Philosophy, Religion, and Political Science. During that second year, we met once a month on Saturday mornings to debate an ethic. Those Saturday debates were among the liveliest I have attended. As the Ambassador of Literature, I found the two years' negotiations with my fellows from other realms refined and tempered my thoughts.

My subject is the universal trait of human beings, language, focused on land use, and this needs no passport. Viewing the subject through literature requires no special visa.

The universals are appropriate because the situation that generated this conference--conflicts among different uses of land--is unique neither to Virginia, nor to the United States, nor North America. Nor to us and Western Europe. Similar conflicts are, in fact, occurring world-wide in every continent, and, in one way or another, in every nation of the world.

After the preliminary sketch of the universals, we will see what is particular about our situation.

As a Slavic proverb has it, "Every gypsy likes his own horse," and if I use my own field of study, it is also because literature is the oldest and most universal of the arts and sciences. Since we have heard much about land today, let us begin with language.

Sketching the Universals

The Universal of Language--There are over 1,000 languages spoken today. Chinese and English have about a billion speakers each. Several languages have fewer than a thousand speakers. Fewer than half of the languages have developed or borrowed a writing system. The oldest writing systems date from 2,000 to 4,000 B. C. Literature literally means "letters," but in ordinary usage means an accumulated body of writings of a people or a culture. Of languages with writing systems, fewer than half have what we call a literature.

Writing systems minimize dialect differences. For instance, speakers from New Orleans and New York pronounce the names of the cities differently and spell them the same way. Writing systems contain more words than any single speaker or writer can use. Shakespeare's written works use 19,000 words, the projected English dictionary for his time will have well over 100,000.

Writing extends a language in time and space. It preserves what otherwise would flee with the moment. Writing can be taken anywhere, and brought from anywhere. Writing also extends a language in complexity. It allows the building up of ideas much more abstract than what a listener can comprehend, but that with time and concentration a reader may comprehend. Written ideas can be built upon and refined and added to, so we do not have to reinvent the wheel each time we need one. A culture with a written language can extend its values and important information in time and space; it can accumulate and use complex bodies of knowledge. It has control and influence above and beyond word of mouth.

Languages are extremely complex. Outlines describing a language's grammar with any thoroughness at all run to hundreds of pages. The most complete dictionary of English is thirteen large volumes--that of Latin has more volumes--and has been in

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progress since 1907, and is half finished. And what would be the labor of writing a grammar and a dictionary of a language that has no writing system of its own? The development of a writing system by a culture is difficult in itself. The acquisition of things worthwhile knowing, and therefore writing or reading, is far more complex than the simple art of letters. By its very nature, it is a job for many minds for a long time.

Thus it is that cultures, which operate by consistent rules, take time to develop and to assimilate writing systems, and it is why they develop knowledge into literatures slowly and by progressive stages.

At first, writing merely records. It copies what already exists. Telling and retelling has shaped and polished the sayings, myths, recitals, and narratives. Then they are written down. This is so for the early versions of religious texts, and it is so for the Iliad and the Odyssey. They continue in oral use, or why write them down? They are scripts for dramatic presentation, they are memorized, many know them by heart. First uses are also administrative. Writing records and stores observable facts needed for taxes, for defense, for settling disputes--any facts that might escape the memory. Initially cultures use writing simply to expand and perpetuate memory.

When enough people are literate that authors write for a general reading audience the culture has progressed into another phase. People write for an individual reader whom they may or may not know. Assuming general knowledge on their reader's part, authors explore the human situations and perspectives of their culture, and they compare and contrast it with other societies. Such writings are the humanities: poetry, philosophy, history, law, and others. They share a style defined by their relation with a generally knowledgeable reader: using forms of discourse derived from speaking situations, they write clearly.

When writers assume their reader shares a body of complex ideas unknown to the general public, the culture has progressed into another phase. The function of writing to examine and to add to highly specialized knowledge is the final stage of literacy. I know of no others.

With the progression of the four uses of language goes a progressive extension of literacy. In oral cultures, of course, no one is literate. In the first phase of a writing system only a relatively few read and write. In the second, literacy extends to those who can afford instruction: available

literacy estimates for several such cultures range between one-fourth to three-fourths of the populations. In the final phase, free and often compulsory education extends literacy to the entire population.

For each phase--from oral communication through extensions of letters of language in time, space, and complexity--a different cultural rule has evolved, and this rule governs land as well as language. The rule expresses itself in principles of ownership and use.

The Universal of Land Ownership and Use--We are born into a language and a land system as part of our natural inheritance, and we have by birth a place in each system. It is the way things are. From birth until death it is a fact of life that we occupy, possess, and use both language and land. Since we do not live forever and life "hath all too short a lease," there is no absolutely permanent tenure, only the span between our first words and our last words. Cultural rules govern what we receive at birth, what we acquire in our lives, and what happens to it at death.

Three principles of who gets the land when a person dies exist:

- the land reverts to a group who owned it,
- the land continues intact with a replacement for the dead person,
- the land is divided among individuals.

The universal starting point in ownership is with the local group that occupies the land. No individual owns land. No person acting alone can sell land because no single individual owns it. Similarly, occupancy and uses are group decisions. There are no exceptions to the rule. From what we know of human history and pre-history, the original cultural principle of group ownership holds true in every time and place. It was the custom on every continent of every people. If there are any absolutes, then group, not individual, ownership of land of preliterate people is one.

The custom of local group ownership persists when the owners are subordinated into a still larger unit. They then owe parts of the fruits of their labor itself to the larger unit. The larger unit--whether a manor, an estate, the church, a city, or whatever--is an office and descends intact from one office holder to the next. The office owns land. This cultural rule occurs with the first phase of literacy.

Most but not all cultures in the first two phases employ an oral ritual of transfer

of personal goods in the first phase and of the office in the second. In front of a specified number of witnesses, dying persons name their successors. Often the successor must be present. The custom often holds true even in the first phase of literacy when wills and land ownership are written down. In any case, in both cultures individuals are at their birth subordinate to larger groups or offices.

Only with the extension of literacy in the third stage of cultural rules does individual ownership occur. It does not happen before then. Plutarch notes the earliest introduction of this custom that survives in writing when he says that Solon (d. 560 B. C.), the Athenian, first instituted wills. Before then "all wealth and estate of the deceased belonged to his family," but if they had no children they "could bestow it on whom they pleased (which) showed that he esteemed friendship a stronger tie than kindred, and affection than necessity; and made every man's estate truly his own." Shortly after Solon's time, individual Athenians could sell and buy land. This was always true in Roman law: the land descended to the individual children of the deceased equally, and persons could buy and sell land.

Wills and deeds are written. The older customs of the first two phases may, depending on variable elements, persist. The political body of the third phase, the city or nation state, also owns land intact for public use, just as other office-holders did earlier.

With the final cultural rule extending literacy fully, land ownership by corporations evolves in a cash economy. Associations intermediate between the individual and the state, corporations preserve all forms of property, land among them, intact. Although individual members may die and divide their shares according to the varying customs of their particular cultures, the corporation is not divided, and, therefore, in form it uses the group ownership rule of the earliest stage of culture. With corporate ownership of land, agriculture is industrialized.

The Universal of Evolution of Cultures

Since language and land developments are consistent rules in the evolution of cultures, we can give each of the four a name. Communal, sacred, secular, and

industrial accurately embody the uses of language and land and accord with historical meanings as well.

Communal cultures. Communal society developed about 10,000 years ago. In the next several millenia, village life becomes widespread in the Middle East and India. Probably the majority of human beings who have lived have lived in communal societies; that is, pre-literate society organized by family, kinship, tribe.

Village dwellings cluster in the center of the fields for crops, livestock, and woods, if any: a simple, efficient geometry. Everything within walking, and talking, distance.

Communal cultures have an intimate association with their terrain. The close relationship with what the senses reveal in their experience they invest with spirit. The infusion of spirit, or animism, is for the Mescalero Apache something that must be sought out as

the individual's power quest. The universe was believed to be suffused with supernatural power, eager to be associated with human affairs; but power could not approach man in undifferentiated form--it had to reach man through some channel, some natural phenomenon, animal, or plant, with which man was familiar. Moreover, it could appear only to believers, to those receptive and responsive to it.²

The traditions and skills pass directly from grandparent or parent generations to the young. So the speech of Seattle (a Dwamish Chief) to the governor of the Washington territory in 1854:

To us the ashes of our ancestors are sacred and their resting place is hallowed ground. You wander far from the graves of your ancestors and seemingly without regret. Your religion was written upon tables of stone by the iron finger of your God so that you could not forget. The Red Man could never comprehend nor remember it. Our religion is the traditions of our ancestors--the dreams of our old men, given them in solemn hours of night by the Great Spirit; and the visions of our sachems; and it is written in the hearts of our people.

Every part of this soil is sacred in the estimation of my people. Every hillside, every valley, every plain and grove, has been hallowed by some sad or happy event in days long vanished . . .

*See Notes, page 24.

We have discussed the universal custom of group ownership of land. Kinship is the distinctive organization of a communal culture.

Sacred cultures. Sacred cultures, cultures with cities and writing, began four- to five-thousand years ago on the Nile, Tigris-Euphrates, and Indus rivers when agriculture could support cities. With a central city for coherence and protection comes the shaping of existing animistic beliefs into anthropomorphic goddesses and gods representing forces of nature.

The temporal rhythm of days, seasons, years, and the motions of sun, moon, stars, and planets combine with the animistic elements to form a stable, predictable order: a cosmology. Time the destroyer lives in the countryside of physical nature, but the regularly recurring patterns of the gods preserve the spirit in eternity in the sacred cities.

Sacred cultures build monuments in accordance with the proportions and harmonies of their cosmologies and intend them to last through the ages. Both Sian and Peking were laid out in accord with religious ideas; the great temples at Angkor Wat, Yucatan, and Luxor, the cathedrals of medieval Europe, and pyramids in Egypt incorporate the beliefs in the designs. Sacred cities are a modern city architect's dream--or, since once built they seldom need further planning, a city planner's nightmare. Most have a temple or palace in the center, surrounded by other official buildings (say, a barracks), in turn surrounded by merchants' shops and dwellings, and then a protective wall, outside of which are lesser buildings, and beyond are villages and their fields.⁴

Relatively few have any reason to learn to read and write, since the literate priests or scholars among them teach the rest the sacred texts if need be. People take their time and energy to make pilgrimages to the sacred city and to memorize the text, and so the scriptures also perpetuate the culture. Sacred civilizations which have endured over long periods of time have encyclopedic texts whose contents were recorded and edited over the centuries. Around them grow commentaries and interpretations many times their length.

Perhaps, because the religion contains a more direct and harmonious blending of the animistic and the cyclical, the Hindu civilization had the most stabilized relationship of city and village. Five thousand years of Hindu law books record the persistence of communal ownership of land, and kinship, caste, and village keep India

rooted at the sacred stage of culture. All sacred societies emphasize kinship and tend to preserve the ownership pattern in the practice of faith.

Secular cultures. Secular cultures rise in commercial cities, most of them ports. The extension of literacy, a cash economy, and the freeing of the individual personality from subordination to a kinship system--all stem from their being cosmopolitan trade centers. Family businesses are typical. The chief structures are public meeting places and transportation facilities; the Agora and the Amphitheater, the Forum, the baths, the Coliseum, viaducts, roads, harbors, squares, and so on.⁵ The privately-owned country estate provides the pastoral escape from the stresses of being at the nerve center of public or commercial affairs.

Literate cultures, sharing understandings bound on paper, being adventurous and aggressive, frequently colonize. When they do, they have often settled land by imposing equal rectangular plots on a map. Although the actual terrain differs from one square to the next, rectangular plots are easy to survey, easy to sell, easy to tax, and easy to conceptualize in the home country.⁶

Literate cultures have used this method in Asia, the Middle East, and the Americas, as well as in Europe. Sharing understandings based on writing, they can live apart and cultivate separated gardens. Their need for company can be satisfied by print instead of people.

Secular culture's authoritative documents are laws or constitutions that have commentaries and interpretations many times their length, and their compilations of knowledge are national encyclopedias, such as the Britannica, Columbia, America.

Secular culture cosmology is a geography. It is indifferent, condescending, or hostile to communal cultures. "Man is the measure of all things" is its motto.

Since it has assumed the previous authority of the family to become the fatherland, the mother country, the homeland, the distinctive institution is the City- or Nation-State.

Industrial cultures. Industrial cultures grow from secular ones. The orientation away from tradition and custom, the use of abstract reason to discover the "secrets" of physical nature, the segmented time for the work day, all go against some sacred tenets or practices.

The distinctive structures are the skyscraper or large office building, the factory, the research center, the school--and therefore transportation and suburbs. The introduction into sacred or secular cities of factories and office buildings used only during work hours displaces residents. Few live where they work. The industrialization of agriculture displaces marginal farmers and most farm laborers from farms into older areas of the city.

Invisible structures characterize industrial cultures to a degree far beyond that of the three previous stages. Telephone, radio, television, computer, calculator, and other electronic communicators create networks above and beyond the range of non-electronic communicators. Only a portion of this network is visible to our common senses. Most are imperceptible to any one person's eye and ear, and yet these channels are the corridors of power, both public and private.

Group decisions no longer need physical proximity. The concentric force of human communications that characterized previous cultures with orderly villages and cities has been supplanted. In its place a random or centrifugal force can and does scatter communities far afield, but people can communicate half around the world in seconds. Any single individual is ignorant of most of the complex ideas. Even an ordinary personal relationship communication needs a context, and intercepted by an unknowing stranger the message is either "greek" to him or liable to misinterpretation.

Industrial culture cosmology comes from physical sciences. It is condescending, indifferent, or hostile to sacred cultures. "Material progress" is its motto. Its distinctive institution is the parent corporation.

The four stages, if viewed from an industrial culture's perspective, are a palimpsest; that is, each superimposed pattern is inked more strongly over the one before it. The communal is faded, the sacred darker, the secular darker yet, and the industrial heavily inked. We can see each, and in our lives deal with each: family, church, state, and large institution. Each has obligations and satisfactions. They often conflict: the industrial age's picture of the material world contradicts that of religion; the secular age's emphasis on travel often ignores the needs of family and neighborhood.

Just as communal culture begins with domesticating animals, so each successive

stage domesticates the previous culture. Presently, industrial cultures are domesticating nation states.

Applying the Universals

Settlement by a Secular Culture--Secular English and Europeans colonized what is now the United States. Here, in the former crown colonies, counties named for Lords Fairfax, Loudoun, Albemarle, and other titled nobility suggest a feudal, sacred society settled Virginia. Few even visited their lands, and none stayed. The lords settled for cash.

Societies tend to understand only cultures immediately above or immediately below their own stage. They share elements used to evolve from one stage to the next. When, however, a stage intervenes between cultures, they do not understand each other; they tend to be hostile. The distance between the native American communal culture and the secular colonists was too great to accommodate both. There were more colonists with more advanced tools than there were Indians. The native Americans who survive intact with a communal culture live in isolated and scattered areas. Their land-use conflicts are authoritatively heard in secular courts, not tribal councils.

No Indians that I know of were in the Piedmont area at the time of settlement; but, from the rest of the map of the continent, the oral tradition of communal ownership of land was virtually wiped clean and heard no more. Written deeds and titles paid for in cash took its place.

To survive and prosper in a secular civilization you need a cash crop. In Piedmont Virginia the cash crop was tobacco. Given kinship obligations, which slavers in all periods of history have known, the more distant from home the less the chance of trouble, the more secure the institution of slavery; and the African slaves, who worked the medium and large holdings, were by design of mixed kinships. Unlike some practices elsewhere, the slaves here were tied to the economy, not the land.

Of second stage culture, sacred civilization, I know some rural Western European groups, such as the Amish and the Mennonites, continue customary ways successfully, but whether they have group ownership of land as the Amana Colony in Iowa and the Slavic brotherhood in the Dakotas do, I do not know. The closest to a sacred city I know is at Salt Lake, and I must admit ignorance of the Mormons' land ownership and use customs. Their city does fulfill the functions of the city in a sacred culture, it

puts individuals in touch with eternity, it has a monumental tabernacle, it has harmonious order, little crime, no noticeable poverty, no slums.

The ambition to have a protestant theocracy in New England was never realized. Diversity of sects, and the fact that in cultural terms Protestantism tends to domesticate religion to the individual and the state, got in the way of a New Jerusalem. So, with the one exception above, we in the United States have no orderly, monumental sacred cities.

The colonizing of the United States by a secular civilization has meant we lack the centuries old traditions that ordered the countryside and cities elsewhere. And with so much land to settle, small wonder we are sloppy.

Language and Culture Evolved Negative Rights--Older societies had to compromise with traditions or have blood baths or centuries of slow change to do away with customs. At our independence it made sense to do away with "entails" and "primogeniture" once and for all. In keeping with the notion of the Nation-State as the guarantor of individual rights, it makes sense to include in our decalogue of negative rights the "takings" clause: "Nor shall private property be taken for public use without just compensation."

The leaders of Piedmont Virginia, Jefferson among them, set out to colonize the rest of the continent, and for the settlement, advocated the rectangular survey as the easiest and most orderly way. It was adopted, and a jet trip across the continent reveals the pattern west of the older colonies. The planners saw a nation of farmers, and the plan had the advantage for their social goals of free, independent citizens relatively equal in the major form of wealth, land. Land lay at the heart of their political ideals. In accordance with Jefferson's insistence upon the "sovereignty of the living generation" and abhorrence of the "dead hand" of the feudal past, American land laws did away with titles "in perpetuity" and other vestiges of a hereditary aristocracy. The new nation had freer laws of contract too, and the simplified land deeds made land more a commodity like any other commodity.

The rectangular survey worked as intended to settle rapidly the continent with a minimum of title and boundary disputes. It worked especially well on flat farm land, but as the abstract pattern of a literate secular society, in many places it was neater in the study than on hills and ravines, where today

it remains difficult to persuade farmers to practice contour plowing inside square boundaries (See Hildegard Johnson, Order Upon the Land, Oxford University Press, 1978). It also encouraged later strip development along once rural county roads, and even in those lands still rural the square plots do cause an excessive mileage of county roads.

The Piedmont Virginians who set the tone for the young nation were agrarians by conviction and by way of life. With Jefferson, they believed the independent yeoman farmer the best safeguard of democracy, and the "servile" city dweller the likely tool of arrogant power. Their attachment to the country and dislike of the city remains a strong strand in our heritage. It persists even though now in an industrial culture more than eighty percent of us live in urban areas.

Secular Declined, Industrial Emerged--The Civil War provides the conventional dividing line for the decline of the secular and the rise of industrial culture in the United States. The secular city exercised its considerable charm with its ample public spaces and monumental public buildings, before skyscrapers, mass transit, and the automobile. It was an inhabited city twenty-four hours a day in all sections. If not an eternal religious monument, it was the chief symbol of humanity.

Industrial society with semi-private corporations now dominate the volume of space in the city: a far smaller proportion is public space. Increase in tempo and rapidity of change of fashion make cities appear to be centers of instability, of ephemera, as well as of impersonal and mysterious forces. The change in scale and pace reverses the roles of city and countryside as they were in sacred civilizations. Now the country is the stable, eternal landscape--the city the home of time the destroyer. The suburb preserves the scale of secular life and enough hints of Jeffersonian agrarianism to link his preference for small independent landowners and personal knowledge of government with the preference of Americans for the suburb.

The industrialization of agriculture has had the most telling influence on land and city scapes. Energy-intensive agriculture has depopulated the countryside of marginal farmers and of farm laborers. They go to cities as refugees.

From our perspective, the "family farm" appeals to our Jeffersonian heritage and has strong competition from corporate farming. One is a sole proprietor or partnership of family labor, the other has group, not individual, ownership. The latest Almanac

says: "In just six years, there has been a net loss of almost 1.5 million people living on farms, with 40 percent of the loss occurring in the past year alone. The farm population is also becoming older, with the sharpest decline in population occurring among children."

Individuals pay inheritance taxes, corporations do not; and corporations can raise the capital necessary for industrialized agriculture easier than sole proprietors can. Our grain, livestock, and other food is produced for the most part by industries operating in a cash economy, not by family farms. As with the family farms so with the family-owned enterprise: most are being absorbed by larger enterprises. In economic life, corporations offer to a person a benefit analagous to what the Nation-State grants its citizens: in return for loyalty, individual security. And so, most of us work in institutions that employ more than 500 people. In an economic conflict, the corporation fights from a battleship, an individual from an open raft. As an old Serb proverb has it, "A man alone is bound to be a martyr."

The Invisible Structures Affect A Land-use Decision--A local land-use decision lends itself to my general language theme of industrial culture.

Recently, a Belgium-based firm decided to locate a facility in the area. SWIFT, which I take it translates into "Society for World International Financial Transactions," wanted to be near Washington, but away from the likely impact area in the event of an atomic attack. It narrowed its choices to Charlottesville and Culpeper.

The firm processes huge volumes of financial data by computers via telephone. It chose Culpeper. Charlottesville has only one long distance microwave link, Culpeper has both a microwave link and a direct land line for its phone service. Charlottesville gets its electricity from VEPCO only; Culpeper is served by VEPCO and has its own small generating plant. Drainage and soil traits were unimportant. A minor consideration was that the Culpeper site had a hill located so the building could be built in its bomb-shadow; but such a hill could be made on the Charlottesville'site for a slight portion of the total construction costs.

With this concluding local example, we have journeyed quickly through language as a context for a new land-use ethic. If our tradition remembers communal and sacred cultures as in a dream, we should not be surprised that our secular, commercial heritage treats land like a commodity to be

bought and sold or even expended, much more so than do nations that have a continuous older tradition.

And therefore the most recent dominant form of culture lays down a pattern on the land less inhibited than it does elsewhere. First railroads, then highways, and then invisible networks of communications dictate land uses.

Summarizing the Piedmont Land-use Conflict

We have defined the land-use conflict in Piedmont Virginia as one between secular and industrial cultural norms. From the first European settlement in Jamestown on, communal and sacred ways of ordering society and land were never the principles that set the rules, never the ideas that dominate our ways of thinking and of doing. The orderly patterns that communal villages and sacred cities impose upon the land have not had the force of law here, nor have they had the dignity of custom and tradition. Some of the values which the older cultures fostered do live on in all of us in varying degrees, and they may even dominate individual lives. However, the forces shaping our collective lives and our land are secular and industrial norms. Secular culture scattered settlement across the continent: the magnetic field of industrial norms resettled the land in urban sprawls.

To state the prologue another way, no sooner had Adam and Eve named things and found each other than they fell out of nature into society. Since then, the family of man has built upon the communal settlement successive stages of sacred, secular, and industrial culture. Language has been a chief architect for each. Each is constructed upon its predecessors, and all depend upon nature.

From foragers on an equal footing with other life in nature, to beings who can travel in outer space, our chief intellectual error has been to mistake the particular for the universal. We take our wish and believe others reciprocate our desire. We take our culture's particular beliefs, customs, and practices for the law of the world. Fascinated with our most recent age, we make it the only one. In our heritage, negative liberty--the individual's right to be free from unnecessary restraint--has been a major theme. We often find more constraints than freedom in society. In the agrarian society Jefferson and others planned, the sovereignty of the living generation and the definition of land as a commodity seemed to assure relative equality of wealth and the best protection of the integrity of the

individual. It failed to forecast that corporations would become individuals under the law also and have about them the aura of negative liberty. Freedom of the individual finds its counterpart in free enterprise.

Because we were a secular society when we immigrated to this land, because as a consequence we devote so much attention to individual rights, because we so much worship negative liberty, we tend to be isolatos (that is, we isolate ourselves from one another). Even in the South, where we place a higher value than the rest of the country upon our land, our family, and our religion, we value individual liberty and material gain highly. The founders of negative liberty and its codifiers on this continent, whose words and deeds have inspired a world less free to become like us, after all made their homes in Piedmont Virginia.

Take our healthy skepticism of authority, and with the common error of the human mind make it an absolute law, and then translate us into industrial society: because its very principle divides our labor into isolated compartments, do we not find it a comfortable fit? Does it not accentuate our individualism? Does it develop our duty to the group or to the lands outside our own little worlds?

Possession of complex knowledge has a universal effect upon us. We have an easy time admiring Einstein. We find it more difficult to admire lesser beings, and quite hard to identify with rocks and stones. We have a scale of values that puts greatest worth on greatest knowledge, least worth on insentient things. In the modern idiom, I relate well with genius; I have difficulty relating to minerals. However, if the natural scientists are right, and I believe they are, we are the children of animals, vegetables, and minerals, and we are obliged to them. Confined to a narrow knowledge in an individualistic tradition, we find it difficult to acknowledge our duty, and honor our father and our mother earth.

In this context our two-year debate produced the suggested land-use ethics.

I conclude with the most trenchant expression of our common fears, the darkest fears of our age, from Thomas Pynchon's novel, Gravity's Rainbow:

Taking and not giving back, demanding that 'productivity' and 'earnings' keep on increasing with time, the System removing from the rest of the World these vast quantities of energy to keep its own tiny desperate fraction showing a profit: and not only most of

humanity--most of the world, animal, vegetable, mineral, is laid waste in the process.

Notes

1. E. A. Gutkind, "Our World from the Air: Conflict and Adoption," Man's Role in Changing the Face of the Earth (University of Chicago Press; Chicago, 1956).
2. Morris E. Opler, Apache Odyssey, edited by George Spindler (Irvington Publishers, New York), 1969), p. 24.
3. The Portable North American Indian Reader Viking Press; New York, 1974), pp. 252-253.
4. Gutkind, ibid.
5. Ibid.
6. Hildegard B. Johnson, Order Upon the Land (Oxford University Press; 1978).
7. Siegfried Kracauer, History: The Last Things before the Last (Oxford University Press; Oxford, 1969), p. 22.
9. Thomas Pynchon, Gravity's Rainbow, (Viking Press; New York, 1973), p. 607.

Bibliography

The slides used at the conference were reproduced with the permission of the University of Chicago Press from E. A. Gutkind, "Our World from the Air: Conflict and Adaptation," Man's Role in Changing the Face of the Earth, 1956.

Language - Linguistics

I. J. Gelb, A Study of Writing, 1963 edition.

Eric A. Havelock, Origins of Western Literacy, 1976.

Martin Joos, The Five Clocks, 1961.

Ravin I. McDavid, Jr., "American English Dialects," in The Structure of American English, 1958, by W. Nelson Francis. (The best account of dialects; and the most readable.)

The writings of Edward Sapir on language.

Ferdinand de Saussure, Course in General Linguistics, 1912 (trans. 1959).

Benjamin Lee Whorf, Language, Thought & Reality, 1956.

Law

Lawrence M. Friedman, A History of American Law, 1973.

Wolfgang Friedman, Law in a Changing Society, 1972.

H. L. A. Hart, The Concept of Law, 1961.

Sir Henry Sumner Maine, Ancient Law, 1876.

Sir Frederick Pollock and Frederick William Maitland, The History of English Law, 1898 (second edition).

"Succession," "Village Life," 11th Edition of The Encyclopedia Britanica.

Sir Paul Vinogradoff, The Growth of the Manor, 1904.

Sir Paul Vinogradoff, The Jurisprudence of the Greek City, 1922.

Literature

Leo Marx, The Machine in the Garden, R. W. B. Lewis, The American Adam, Roderick Nash, Wilderness and the American Mind.

I am indebted to William R. Burke, my student in the Political and Social Thought Program, for the reference to Thomas Pynchon.

Miscellaneous

J. B. Jackson, Landscapes, 1970.

Hildegard Johnson, Order upon the Land, 1978.

Ian McHarg, Design with Nature. A sound discussion of land use with examples from Piedmont Virginia.

Dallas D. Miner, Farmland Retention in the Washington Metropolitan Area, 1976.

Norman T. Newton, Design on the Land: The Development of Landscape Architecture, 1971.

TRANSFERABLE DEVELOPMENT RIGHTS IN CALVERT COUNTY, MARYLAND

By Gregory A. Bowen#

Between 1969 and 1974, Calvert County lost one-third of its farmland. Residential growth since 1974 has actually increased. Faced with the grim realization that no action could mean no farmland in our lifetimes, the citizens and the County government began in 1976 to develop a plan to preserve farmland. The results of this work, which has taken three years, state enabling legislation, and numerous public hearings, employs two planning-techniques: Agriculture Preservation Districts (APDs) and Transferable Development Rights (TDRs).

An understanding of the agricultural preservation program requires some background and description of the County. A brief description of the County is presented first, followed by the history of the program.

Description of the County

Located in Southern Maryland, Calvert County is bounded on the east by the Chesapeake Bay and on the west by the Patuxent River. Containing approximately 219 square miles, Calvert County is the smallest county in Maryland and has traditionally been a rural area. From 1900 to 1950, the County's population was approximately 10,000.

Tobacco is the major income producer. This has allowed smaller farms to be viable. The average size is 85 acres. A variety of other farm products are raised along with tobacco, including truck crops and grains.

Calvert County's zoning includes large-lot (five acre) zoning for its Agricultural Zone, which applies to some 70 percent of the total land area. Large-lot zoning has been only moderately effective in slowing down the conversion of farmland, and leap-frog development of farmland has occurred.

Growth in the County can be attributed to three factors: the commuting distance to the Washington (D.C.) Metropolitan Region, the water communities, and the rural character of the area. Since 1970, the County's population has grown from 21,000 to 34,000 (an increase of 62 percent). In recent years, Calvert has been the second fastest growing county in Maryland. Only Howard County has grown faster.

History of the Program

Planning for the agricultural preservation program began in 1976, and the County government wisely chose to encourage the citizens (most often farmers) to develop the strategy. This contributed to later acceptance of the program. Many ideas were discussed, but prevalent in the thinking was that the program should be voluntary, not discourage growth, and be of minimal cost to the taxpayer.

The plan which evolved recommended that voluntary Agricultural Preservation Districts be utilized to protect farming communities and to retard what is referred to as the "impermanence syndrome". To give the farmer an alternative to outright sale of his or her farm, as may be necessitated by death, inheritance taxes, illness, or other reasons, the plan recommended that the County obtain enabling legislation, so that a farmer's development rights could instead be sold. These were to be relocated, in turn, in transfer zones located in the Agricultural Zone but in areas containing the less viable agricultural land.

In 1977, the legislators representing the County obtained from the state legislature enabling legislation for what has become the Calvert County Agricultural Land Preservation Program. Under provisions of this law, the County Commissioners, who are the persons elected to govern the County,

*See Notes, page 28.

appointed an Agricultural Preservation Advisory Board to establish regulations and directed the County Planning Commission to prepare a recommendation for designation of transfer zones.

In 1978, the Advisory Board completed preparation of its implementing procedures and regulations for the program and identified the Designated Agricultural Areas (DAAs). These were prime agricultural and forestal lands, where preservation should be given priority. In March of 1979, the County Commissioners designated the Transfer Zones in which the Transferable Development Rights (TDRs) could be used. Thus, the County was readied for its first Agricultural Preservation District.

The Plan

In simplified terms, the County program may be described as follows:

The owner of productive farmland or forestland may petition that his property be placed in an APD.

The Advisory Board approves or denies the petition. If approved, the land remains in the APD for at least eight years, during which farming and forestry remain the predominant uses and no more than three residential building lots can be subdivided from it.

The owner of land in an APD may offer to sell TDRs, one per acre with certain adjustments. Concurrently with the sale of TDRs, an agricultural/forestry covenant is placed on the land.

The TDRs may be sold on the open market and may be used by a developer in a designated Transfer Zone to decrease the size of residential lots from five acres to not less than one acre. The price of the TDR is negotiated between the buyer and seller.

The Advisory Board, consisting of five members and including at least three farmers, accepts or rejects applications for APDs based on the following criteria: the present land use, the percent of cropland, the suitability of soil, and the amount of contiguous farmland. The minimum acreage for initially forming an Agricultural Preservation District is 300 acres of contiguous land or 500 acres of noncontiguous land.

The benefits of joining an APD include

- protection from local nuisance ordinances,
- limitations on the right of eminent domain, unless no other viable alternative exists,
- protection from special assessments including front-foot assessments for public water or sewage, and
- the option to sell TDRs.

The Transfer Zones designated by the County are located in areas that, because of their suitable topography and location, can absorb higher density and have a lesser potential for future agricultural uses. As an example, an appropriate location could be a parcel located on an adequate road and surrounded by residential development. Now that the program is in operation, property owners can also apply to form Transfer Zones.

A key to the salability of the TDR concept in Calvert County is the County's large-lot zoning. The development rights are valuable because smaller lots are proportionally more valuable than the five-acre lots, that is, one-acre lots are worth \$15,000; two-and-a-half acre lots are worth \$25,000; five-acre lots are worth \$35,000. A developer owning five acres could hypothetically make an additional \$15,000 by forming two lots through the purchase and transfer of development rights.

Will It Work

Although supported by the farmers from the beginning, the program is difficult to understand. Therefore, the farmers have been hesitant to form APDs. However, as of December 1980, eleven farms totaling over 1,800 acres have been accepted into the program.

TDRs have been sold from one farm; the price was not disclosed. The initial value of the first TDRs sold will be a key to whether the farmers as a whole accept or reject the plan.

Notes

1. Calvert County, Maryland, Code art., Section 273-282 (Supp. 1970).

SAVING PRIME FARMLAND: THE SUFFOLK COUNTY EXPERIENCE

By David F. Newton#

Suffolk County, encompassing the eastern two-thirds of Long Island, is the leading agricultural county in the state of New York. The sale of potatoes, vegetables, ducklings, fruit, sod, flowers, and nursery stock generates \$80 million in income for growers each year.

The fact that Suffolk has maintained its first-place standing is quite remarkable considering the rampant suburbanization that has occurred in the County over the past 40 years. During this period, population skyrocketed from just under 200,000 in 1940 to over 1.4 million today.

This suburbanization, spreading eastward from New York City through adjoining Nassau County, has all but obliterated the farms situated in the western part of the County.

There remain today about 50,000 acres of farmland, about half the number under cultivation in 1950 when the acreage in farms reached its peak of 123,000 acres. Over 90 percent of this acreage is located in the three eastern towns of Riverhead (20,000 acres), Southold (13,000 acres), and Southampton (10,000 acres).

Most of the agricultural soils are classified by the U. S. Soil Conservation Service as prime, that is, as Class I and Class II. These soils are deep, well drained, relatively free of stone, and medium to moderately coarse-textured. Because of their sandy nature, the soils are quite acidic (the pH is around 5) and low in natural fertility. However, with fertilization, they are highly productive soils.

Approximately half, about 23,000^{1*} acres, of the farmland acreage is used to grow potatoes.

Suffolk is blessed with a long growing season--it is over 200 days--and a moderate climate and abundant rainfall. However, during the summer months, farmers must irrigate crops in the northern half of the County because of dryer conditions and lighter soils. All water used for irrigation is drawn from the upper glacial aquifer.

On the average, over 50 percent of all the farmland in Suffolk is owned by non-farmers, including investors, speculators, and retired farmers. However, nearly all of this land is rented on an annual basis to active farmers.

Zoning, Values, and Taxes

Almost all of the farmland is zoned for residential use with agriculture listed as a permitted, but not exclusive, use. The zoned lot-size varies from one-half to two acres. A small amount of land is zoned for commerce and industry.

The full market value of raw farmland, when no subdivision plat is on file, ranges from about \$3,000 per acre in the Riverhead area to over \$10,000 an acre on the South Fork. This is considerably less than the values of five and ten years ago when rampant speculation drove values to \$8,000 per acre in Riverhead. The agricultural value of the land is estimated to be \$1,000 to \$1,500 per acre.

In general, property tax assessments on farmland range from \$250 to \$500 per acre, varying with location and zoning. Assuming an average tax rate of \$30 per \$100 of assessed valuation, the property taxes on the land range from \$75 to \$150 per acre.

The primary reasons for the conversion or abandonment of farmland in Suffolk are speculation and taxes. When speculation was

*See Notes, page 32.

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rampant during the 1960s, many farmers succumbed and sold their land. When such land was offered for sale, the price was beyond the ability of other farmers to buy it. Thus, the speculators and real estate interests acquired the land.

Taxes, both property and estate, have also forced farmers to sell out. It has only been since 1971 that farmers have been able to get property tax relief on their land under the provisions of the New York State Agricultural District Act. As for estate taxes, even the revisions of the federal law have not helped that much. The estate tax is still staggering despite the higher deductions because of the high value of land and equipment.

Action Taken

Confronted with all these problems, agriculture in Suffolk had a bleak future. But in 1972, the newly-elected County Executive John V. N. Klein decided to look into the matter and to see if something could be done to halt the loss of farmland. He created a fourteen-member Agricultural Advisory Committee comprised of growers and other local agricultural experts to examine the situation and to come up with a plan. Following two years of deliberation, during which such farmland preservation measures as zoning, cluster development, transfer of development rights, purchase and leaseback, and agricultural districting were examined, the committee recommended that the County purchase the development rights of large tracts of prime farmland, an act authorized in New York State under Section 247 of the General Municipal Law.

The proposal for a purchase of development rights (PDR) program was submitted to the County Legislature in March 1974 and subsequently won the support of that body with the enactment of Suffolk County Local Law No. 19. The plan called for saving from 12,000 to 15,000 acres of prime farmland through sales acquisition from voluntary action at an anticipated cost of \$60 million.

Phase 1--In December 1974, the County mailed letters to all farmland owners inviting them to submit bids specifying the acreage they wished to offer and the price being asked. The response was overwhelming. On the 11th of February 1975, a total of 380 bids were opened. These encompassed about 18,000 acres at an asking price of \$117 million.

The bids, after being opened and read publicly, were turned over to the County Real

Property Tax Service Agency for mapping. The bids and maps were then forwarded for review to a Select Committee--comprised of the County Executive, Planning Director, three county legislators, representatives of the towns, and Cooperative Extension agents. The property represented by each bid was evaluated on the basis of soil quality, topography, contiguity to other farmland, situation relative to development pressures, and asking price. The Committee found that 13,900 acres valued at \$83 million met minimum requirements and subsequently recommended that these lands be appraised to impartially determine their development rights value. Two private appraisal firms, one to estimate market value and the other to determine agricultural value, were retained by the County.

During the following months, the program hung in the balance as certain financial and political considerations were resolved that need not be elaborated here. Suffice it to say that the County Legislature approved a resolution in September 1976 authorizing a \$21 million bond issue to purchase the initial properties. This has been referred to as Phase 1 of the program.

Upon completion of the appraisals, representatives of the County met individually with farmland owners to work out the terms of the purchase contract. These contracts were then cleared by the county attorney's office and submitted to the County Legislature for approval.

The first contracts were signed in September 1977. Since then, the County has purchased the development rights to over 3,200 acres in the three eastern towns of Riverhead, Southold, and Southampton at a cost of about \$10 million, thereby completing Phase 1.

Phase 2--During the summer of 1978 Phase 2 got underway when the County made another general solicitation for bids. This resulted in the submission of 262 bids encompassing nearly 13,000 acres at an asking price of about \$72 million. Since that time, these bids have been screened by the Select Committee which recommended that 6,600 acres be appraised, most of which are located in the eastern towns, although some land is also situated in the western part of the County. The appraisal work is now underway and is expected to be completed by early 1981, whereupon the County will repeat the procedure described for Phase 1. The remainder of the \$21-million bond issue will be used to acquire these properties.

Some Administrative Details

At this point, it seems appropriate to back up and fill in some of the administrative details of the program.

The bidding process is carried out in accordance with standard procedures, including the setting of a deadline for receipt of bids and a public opening of all bids on a specific date. However, none of the bids are binding on either the owner or the County. Either party can discard the bid prior to the actual signing of a contract.

The raising of funds to purchase development rights is by the sale of thirty-year general municipal bonds. Approval of a bond resolution requires a two-thirds majority of the County Legislature.

The Suffolk County Department of Real Estate handles most of the paperwork for each transaction, including the verifying of appraisal figures, conducting negotiations with landowners, and preparing the contracts.

Upon the sale of development rights, the landowner retains the rights of ownership and possession and the right to use and sell the land solely for agricultural purposes. The owner may also leave the land fallow because this is not prohibited by the local law. The County holds the development rights in perpetuity. Should the County ever desire to sell development rights back to an owner of the land from which they were severed, such sale must be approved by a majority of the voters in a countywide referendum. Furthermore, the parcels from which the development rights have been purchased cannot subsequently be subdivided for sale without approval of the County Legislature except when the land is divided among heirs by a will.

Implementation of the program has been hampered at times by various financial and political considerations. Since the program is funded solely by the County, local property owners must shoulder the entire financial burden. Although this cost is not, in itself, a great burden, it has come at a time when the County is financing a massive sewer project which, because of major cost overruns, brought the County close to bankruptcy in 1977. Thus, any additional major capital projects, such as the farmland program, are viewed with great caution since property owners, especially those in the sewer district, are already paying the highest property taxes in the nation.

Another financial matter which caused uncertainty and delay pertained to the method

of paying farmland owners for the development rights. To minimize the amount of capital gains taxes that the farmers would be required to pay, the County sought approval of a special installment-payment plan from the Internal Revenue Service. (In New York State, governments are not authorized to purchase land on installment.) The IRS, after nearly three years of deliberation, refused to approve the plan. This had a significant impact on the program because half of the owners who submitted bids for Phase 1 had requested payment in installments and were, as a result, dropped from the program. These owners had the option to resubmit a bid in Phase 2 if they were willing to accept a lump-sum cash payment.

In the realm of politics, the program also came under attack. Although partisan politics was a factor at times, the major confrontation was over regional issues. Geographically, Suffolk is a linear county with the western towns densely developed and the eastern area still rural. As a result, 16 of the County's 18 legislators represent western constituencies which, in turn, pay for most of the County's expenses. Since most of the farmland is located in the east end, many people in the western towns felt they would not benefit from the program but would still have to pay for most of it.

Another political element was the defeat of County Executive Klein in the Republican primary in September 1979. When Mr. Klein left office in January 1980, the County government lost its major architect and proponent of the farmland preservation program.

The new County Executive, Peter F. Cohalan, subsequently transferred the administration of the farmland program to the County Planning Department. The program continues to move ahead, with appraisals of Phase 2 parcels expected to be completed by April and purchases to begin by summer. In addition, the local law which established the program has been modified to increase the membership of the Select Committee and to expand its responsibilities.

Yet, another issue dealt with the speculators who owned farmland. Over half of the bids that came in were from owners who were speculators and there were many people who opposed bailing these people out at county expense. However, those who support the program argue that the only way to prevent farmland development is to buy the speculators out.

The Future of Agriculture

The PDR Program was never intended to save all the prime farmland in Suffolk. Rather, it was designed to save some of the acreage and to serve as a catalyst for preservation of much of the remaining land. In this respect, the program appears to have been successful. Since the inception of the program, many farmers have become more optimistic about the future of agriculture in Suffolk. Several have taken advantage of the state's Agricultural District Act, creating districts and signing individual commitments which provide property tax relief and certain other benefits. Town governments in the eastern part of the County are also exploring ways of helping to save farmlands. In November 1980, voters in the town of Southampton, by a margin of 3 to 1, approved a \$6 million bond issue, authorizing the town to purchase farmland development rights as a supplement of the County PDR program.

Two other factors also make the future brighter. The majority of the participants in the County program have been non-farmers. Speculators, overextended financially, are selling development rights to the County and the titles to agricultural use to farmers, so there is a shift in the overall farmland ownership to the active farmer. Coupled with this is the dramatic slowdown in development in Suffolk. For the past four years, there has been very little large-scale development, giving the County time to implement its program.

There are still many questions about the PDR approach to farmland preservation. To be sure, it is an expensive experiment. But, the combination of circumstances in Suffolk have made it necessary, and, fortunately, it appears to be working.

Interested persons may find useful the following list of publications dealing with farmland preservation generally and the Suffolk County program specifically.

Notes

1. This acreage was reduced drastically in 1980 to about 15,000 because of a law on the use of a pesticide following discovery of widespread groundwater contamination. Another 5,000 acres are used for growing such vegetables as sweet corn, tomatoes, cabbage, and cauliflower. Sod is grown on 3,000 acres, and nursery products (trees and shrubs) occupy about 3,500 acres. The remaining agricultural land is used to raise fruit (peaches and

apples), wine grapes, poultry (including 25 White Pekin duck farms), dairy cattle (5 active farms), horses, and grains (mainly rye, but some wheat).

Most agriculture in Suffolk County is very capital intensive, involving the use of much expensive equipment. This is especially true for potato production. However, vegetable farms as well as operators of nurseries and growers of flowers still rely heavily on manual labor.

Bibliography

1. Bryant, William R., Farmland Preservation Alternatives in Semi-suburban Areas (April 1975) (Department of Agricultural Economics, NYS College of Agriculture and Life Sciences, Cornell University, Ithaca, NY 14853).
2. Commission on the Preservation of Agricultural Land, Preserving Agricultural Land in New York State (January 1968) (Office of the Governor, State of New York, Albany, NY 12200).
3. Conklin, Howard, Recent Modifications in Governmental Mechanisms for Modifying Rural Land Decisions in New York State (November 1973) (Department of Agricultural Economics, NYS College of Agriculture and Life Sciences, Cornell University, Ithaca, NY 14853).
4. Conklin, Howard, Recent Modifications in Governmental Mechanisms for Modifying Rural Land Decisions in New York State (November 1973) (Department of Agricultural Economics, NYS College of Agriculture and Life Sciences, Cornell University, Ithaca, NY 14853).
5. _____ and William Bryant, Agricultural Districts: A Compromise Approach to Agricultural Preservation (September 1974), ibid.
6. _____, Facilitating the Continuance of Agriculture Through Voluntary Districting of Agricultural Areas (October 1974), ibid.
7. _____, Legislation to Permit Agricultural Districting in New York (August 1978), ibid.
8. Conroy, Ralph, Preserving Prime Agricultural Land in the United States (December 1978) Institute of Man and Environment, State University of New York, Plattsburgh, NY 12901).

9. _____ and Richard Dymysa, Maintaining Viable Agriculture in Areas of Urban Expansion (National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22150).
10. Davies, Robert, and Joseph Belden, A Survey of State Programs to Preserve Farmland (April 1979) (U.S. Council on Environmental Quality, 722 Jackson Place, NW, Washington, DC 20006).
11. Hunter, Michael, Unique Agricultural Lands: A Resource in Jeopardy (March 1975) (Office of Land Use and Water Planning, U. S. Department of the Interior, Washington, DC 20000).
12. Klein, John V. N., Farmlands Preservation Program: Report to the Suffolk County Legislature (September 1973) (Office of the County Executive, Suffolk County Center, Hauppauge, NY 11787).
13. _____, Report of the Suffolk County Agricultural Advisory Committee to the the Suffolk County Legislature (March 1974) (Office of the County Executive, Suffolk County Center, Hauppauge, NY 11787).
14. _____, Report to the Suffolk County Legislature from the Select Committee on the Acquisition of Farmlands (1975), ibid.
15. Kolesar, John, and Jaye Scholl, Saving Farmland (March 1975) (Center for Analysis of Public Issues, 92-A Nassau Street, Princeton, NJ 08540).
16. Newton, David, Creating Ag Districts: Information, Guidelines, Suggestions (Suffolk County Cooperative Extension, 246 Griffing Avenue, Riverhead, NY 11901).
17. _____, Individual Commitments Under the NYS Agricultural District Act (Suffolk County Cooperative Extension, 246 Griffing Avenue, Riverhead, NY 11901).
18. _____, Farmland Owners Guide to Farmland Preservation, ibid. (This publication contains the County's enabling legislation, the key definitions, the farmland selection criteria, and the step-by-step procedure for implementing the PDR Program).
19. Northeast Regional Center for Rural Development, Proceedings of the Conference on Rural Land-Use Policy in the Northeast (February 1975) (Northeast Regional Center for Rural Development, Cornell University, Ithaca, NY 14853).
20. Standing Committee on Agriculture, Preservation of Agricultural Land: A Review of New York State's Agricultural Districts Law (October 1978) (NYS Assembly, State Capitol, Albany, NY 12200).
21. White, Donald, and Kenneth Gardner, New York's Agricultural Districts Program: An Analysis of Farmers Perceptions in 17 Counties (June 1978) (NYS College of Agriculture and Life Sciences, Department of Agricultural Economics, Warren Hall, Cornell University, Ithaca, NY 14853).

RETAINING QUALIFYING LAND IN AGRICULTURAL USE: SOME POLICIES REVIEWED,
WITH SPECIAL EMPHASIS ON THE MICHIGAN AND WISCONSIN LAWS

By J. Paxton Marshall#

Very gradually, and frequently by a process of trial and error, a policy is being set up to limit losses of fertile agricultural land, to improve the organization of land transfers from agriculture to urban sectors and to make agriculture an active and positive factor in the environment.

Organization of Economic
Cooperation and Development

As the epigram makes clear, interest in developing policies to retain qualifying land in either agricultural use or a condition that would enable such use at some reasonably near period, say in 10, 20, 50, or 100 years, is being expressed by people in many nations, as well as in states of the United States.^{1*} Several policies designed with an announced objective of retaining land in agricultural use have² been developed by individual states.² This paper traces the development of these policies, devoting special attention^{3, 4} to laws in effect in Michigan and Wisconsin.

Consider Some Word Usage at the Outset

One problem in any type of policy development is the way people perceive the meaning of some word or words used in describing the purpose of a policy. Preservation is a word subject to misunderstanding. As a result, this paper avoids the word preservation. As Gustafson has stated, "preservation suggests absolute inflexibility--that farmland must be saved regardless of cost."⁵ So, this paper joins Gustafson in using the word retention. "Farmland retention," says Gustafson, "is meant to imply that options are being kept open--that in the future the public interest might best be served by high-rise development on cropland under one set of circumstances

and permanent 'preservation' as cropland under another."⁶

Cooperative Effort Is Spurred By Land-use
Pressure

Cooperative efforts to solve land-use problems have been difficult to develop. However, as owners of land and the public have sought to design policies that would retain land in agricultural use, the need to develop and adopt policies requiring cooperative action by landowners has become a necessity.

This search becomes more intense when people living in a community recognize that there is pressure on the land. Pressure is displayed when the market price of land encourages (sometimes forces) landowners to shift their land to a use that differs from that which people who live in a community where such a shift occurs view as customary. The community often reacts to the first such shift with dismay. Then, as each community that has experienced land-use pressure has learned, the shift of land towards more intensive uses is followed by an increase in real property taxes.

In the search for policies to ease the effects of pressure on land new institutions have been established. This effort has produced several major initiatives. The first was differential taxation.

Differential Taxation

Owners of land lying within the range of pressure created by expanding metropolitan centers first turned to tax policy as a means of easing the tax burden caused by urbanization. They proposed differential taxation. That is, the impacted land would be valued for tax purposes in accordance with its value in the use being made of it, as

*See Notes, page 42.

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compared to the traditional system of valuing land for tax purposes at fair market value. This was a proposal to change the basis for taxing eligible land from an expected alternative use, as reflected in fair market value, to a tax based on the income stream from the qualifying use of the land. Today, differential taxation is generally known as use-value taxation. The tax at fair market value and at use value will be the same when the land at issue has no alternative use valued higher on the existing open market than the use that qualifies the land for use-value taxation.

Several arguments were presented in the early debates about use-value taxation. These arguments were customarily linked with the belief that reduced taxes on land devoted to agricultural use would reduce the rate at which such land would shift to more intensive use, the view that property taxes on farm property are too high relative to farm income, and a preference for the use of incentives rather than regulations as a means of obtaining desired uses of land.

Differential taxation was first adopted by the state of Maryland in 1956, but the need to resolve constitutional issues,⁷ delayed the first year of its use until 1961. Since then some 45 states have adopted legislation authorizing taxation of land devoted to certain extensive uses, in particular to agricultural uses, in accordance with its use value. Such taxation has taken three basic forms. These are referred to as preferential taxation, deferred taxation, and restrictive agreements.

Preferential taxation--The first policy designed to use differential taxation to retain land in agricultural use employed what is now referred to as preferential taxation. The preferential form provides that owners of eligible land pay the tax owed in accordance with the land's use value and that any difference in the tax paid on the use value and the tax owed on the fair market value would be immediately forgiven. There is no lien against the land.

Maryland was the only state to adopt differential taxation in the preferential form. Some eight years after adopting preferential taxation the Maryland legislature amended the law to provide for deferred taxation.⁸

Deferred taxation--Deferred taxation provides that the owner of eligible land pays the tax owed in accordance with the use value of the land and that the difference between the tax owed on the fair market value and the tax paid on

the use value shall be deferred and be a lien against the land for a given number of years--the rollback period. If the eligible land is converted to a non-qualifying use when all or a part of a rollback period is in effect, the applicable deferred taxes become due plus interest at a specified rate.

The first statute designed to apply the deferred form of differential taxation to eligible land was adopted by New Jersey.⁹ This occurred because people soon realized that preferential taxation would not effectively retain land in agricultural uses and that when eligible land was shifted to more intensive uses a cost was imposed upon the local government. Deferred taxation developed because communities realized that the landowner had gained a substantial benefit by being able to hold the land until the time it "ripened" for development and was converted to more intensive use. Therefore, it was argued that paying a portion of the deferred taxes as the rollback tax was a more socially equitable form of taxation than the preferential form. Deferred taxation is now widely used.

Restrictive agreements--Restrictive agreements are involved when the local government enters into a contract with the landowner (or, as with the petitioned ordinance, achieves the equivalent of a contract, an agricultural district). Such agreements provide that the eligible land at issue shall have the benefit of use-value taxation, if the latter agrees that the use of the land shall be restricted in accordance with the contract's terms.

The first statute designed to use the restrictive agreement to regain land in agricultural use was enacted by California.¹⁰ Localities were granted local-option authority to contract with landowners who would agree to a ten-year continuing-term contract. Each year such a contract is automatically extended by one year if neither party acts to cancel it.

As a policy for retaining land in agricultural use the effect of differential taxation has been modest. There may be many reasons. A basic one is that earnings from land devoted to agricultural use are rather low. So, if the net return per acre devoted to agriculture averages, say, \$100 annually, an owner of land having a market value of, say, \$2,000 per acre can easily determine that at, say the traditional, 6 percent rate of interest earnings would be \$120 per acre.

Many owners observe even greater differences in returns. As a consequence, they have continued to convert their land to more intensive uses. Hence, differential taxation alone provided benefits as a tax policy that the public made available as a condition of equity. However, such taxation contributed little towards land-use policy. This condition applied whether taxation was in the differential, the preferential, or the deferred form.

Studies of the restrictive agreement program in California found that owners of land lying 15 or more miles from the edge of an expanding metropolitan center generally entered into the contracts. However, those with land lying within 15 miles of such a center rarely entered into a contract.¹¹ This means the restrictive agreement system seldom benefited the land toward which the program was directed. Landowners did not enter into contracts because they expected to sell their land for development; they wanted no restraints. Their expectations were seldom fulfilled. Most landowners who did not enter into a contract made a mistake; they neither sold their land nor had the advantage of use-value taxation.

Landowners were rebuffed in New York when they approached their legislature in 1966 with a bill to authorize use-value taxation. This occurred again in 1967. Four years later, New York was the first state to enact a law that authorized local governments to establish agricultural districts.

Agricultural Districts

The New York statute employed a totally new institutional arrangement in the effort to retain qualifying land for agricultural use.¹² This law produced a policy that contained at least five firsts: (1) land qualifying for agricultural use was treated as a resource, (2) except for the special case of a one-owner district, cooperative action by landowners was required to establish a district, (3) rules designed to reduce pressure on land lying within a district were instituted, (4) local government was assigned a role in determining the land that would be within an established district, and (5) state government participated in evaluating a district. These firsts were accompanied by an incentive--use-value taxation in the deferred form would be made available to qualifying land that the owner(s) had signed-up to have in a district and that the local assessing official determined to be qualifying and made eligible for such taxation by formal action of signing the required application. The district "runs with the land," therefore, the district is a feature of any sale.

Landowners responded; many districts were formed. Some 415 districts had been established in New York by late 1979. These contain slightly over 6,000,000 acres. However, agricultural districts rarely have been established for land lying within 15 miles of an expanding metropolitan center.

The New York agricultural district law became a pattern for the Virginia Agricultural and Forestal Districts Act adopted by the General Assembly of Virginia in 1977 and amended in 1979.¹³ This law did not provide for state government to participate in evaluating a district. Initially, the Virginia law received little attention from owners of land. However, the amendments made in 1979 reduced uncertainty and brought forth substantial interest.

Development Rights Purchase

The development rights purchase program was initiated in an attempt to overcome the problem of landowners failing to act voluntarily to retain land in agricultural use, when the land lay within the fringe of an expanding metropolitan area. The central feature of a development rights purchase is that the development can be severed from the land.

The several rights associated with land are reflected in its fair market value. This value can be divided into two parts: the value of the land in the use being made of it, and the value obtained when the use value is subtracted from the fair market value. The former is generally the value in agricultural use. The latter is termed the value of the development rights. Any deferred tax on a parcel of land is expected to reflect the tax levied on the value of the development rights. Basically, the development right enables a landowner to erect a residential, commercial, industrial, or other structure upon a parcel of land shifted to a use more intensive than agriculture.

When development rights are purchased the right to develop is severed from the parcel of land at issue, and the public buys such right as an easement represented as a restrictive covenant. The land is expected by both the public and government to be devoted to agricultural use, so thereafter the land is taxed only on the value it has in such use. A development rights purchase program buys such rights from some, but not necessarily all, landowners who elect voluntarily to sell such rights from their land. A near-complete set of criteria have been established for such programs including certain designated location criteria.

The first action designed to purchase development rights was taken by Suffolk County, New York.¹⁴ Two other county-level programs of this type have been established by referendum, one in Howard County, Maryland, and one in King County, Washington. There are state-level programs in Connecticut, Maine, Maryland, Massachusetts, and New Hampshire.

A development rights purchase program has a crucial feature; the result is more certain. Land meeting the eligibility criteria is retained for agricultural use and is retained for such use in a way considered more equitable by the seller of the development rights. As long as the cost remains acceptable to the public, land lying at the edge of an expanding metropolitan center can be retained in agricultural use. This is an objective sought by the several differential taxation programs and the agricultural district program, but not achieved.

Development rights purchase programs will generally be expensive. Even so, such a program has special importance in places where the land at issue is recognized as unique and irreplaceable agricultural land.

Transferable Development Rights

The transferable development right is an institutional arrangement designed to decrease the density of development in one area of a locality by increasing such density in another area of the same locality.¹⁵ Several small-scale efforts to implement transferable development rights have been put into effect by local governments. However, not more than a dozen such transfers occurred prior to the close of 1979.

The ideas on which development rights purchase and transferable development rights are based differ substantially. That difference is this: a government is intended to be the direct purchaser and final owner when a development rights purchase program is in effect. A landowner (qua developer) is intended to be the direct purchaser but neither the final nor a continuing owner of transferable development rights when such a program is in effect.

A transferable development rights program requires authorization by both state and local government. The Dillion Rule requires the state action to be first. Then, the local government can act. A basic effect of a transferable development rights program is to void a primary assumption of the existing property system. Namely, "that the development potential of a site may be used only on that site."¹⁶ So, the effect of

creating transferable development rights is to sever the development right from the land and by such action change the development right from real property to intangible property.

A transferable development rights program is normally associated with a resource protection goal. Retaining agricultural land in such use is such a goal.

A transferable development rights program would be undertaken in no fewer than five basic steps. Each step requires an acceptable political climate. First, a comprehensive plan complete with a set of zoning rules applicable within the locality and its communities would be prepared and adopted. Second, the development rights would be described and the documents representing such rights created. Third, an institutional arrangement would be established to provide a market for such documents. Fourth, the documents would be allocated to the designated land (owner owning land) in the community. Fifth, the development rights would be severed from the designated land and the program placed in operation.

With transferable development rights the basic question is this: A single transferable development right shall be constituted of what? The answer has at least two parts: The first is simple and straight forward. A transferable development right is constituted of the right to convey from designated land in community A to designated land in community B a stipulated right to develop. The second part is constituted of what is determined to be the stipulated right to develop. This is neither simple nor straight-forward. The reason is that an unsevered development right in land (that is not zoned) encompasses an unlimited series of opportunities. By contrast, the transferable development right is constituted of a precisely stipulated right to develop represented by one (or at most a narrowly limited series of) development opportunities. Thus, a transferable development rights program narrows the development right in land from an unlimited series of opportunities in the unsevered state to one (or a carefully limited series of) opportunity cost(s) in the severed state. When this latter is determined the second part of the answer to the question, A single transferable development right shall be constituted of what? is provided. Because many parcels of land and even more owners will be involved the local governing body will find it necessary to negotiate what shall constitute the precisely stipulated right to develop embodied in a single transferable development right. After this negotiation is completed

the documents representing the transferable development rights can be created.

Transferable development rights programs require financing. The intent of such programs is that the local governing body will have designated an area in the locality to have increased density and that the designated area will be the area developed. That is, the density of development in the designated area will be increased. To achieve this increased density, the developer would purchase the transferable development rights from the owners of such rights who own land lying in the community designated by the local governing board to have decreased density. When a developer purchases the transferable development rights from a landowner in such community and transfers them to the community with greater density and uses them, such rights would be effectively extinguished.

The real world works differently than a transferable development rights program is intended to work. Consequently, there is evidence provided by at least one court case that an intermediate purchaser, such as a development rights bank, may be required for a transferable development rights program to become effective. Such an intermediate purchaser would provide a market for the transferable development rights. Initially, the government that authorizes a transferable development rights program may need to establish a development rights bank to serve the function of providing a market for such rights.

The first action by a state to authorize a transferable development rights program was taken by Maryland when the legislature enacted a law authorizing Calvert County, Maryland, to install such a program.¹⁷ This program has been established but its effectiveness can only be determined over the next few years.

Transferable development rights programs appear to hold some potential for enabling a locality to achieve land-use goals. However, the institutional arrangement is much more complex than that associated with differential taxation, agricultural districts, and development rights purchase.

The Michigan Law: Circuit-Breaker with Contract

The Michigan legislature enacted a farmland and open space preservation act in 1974, a law designed to retain qualifying land in agricultural use.¹⁸ This law produced a policy that contained at least six firsts: (1) the circuit-breaker approach was adopted as a means of relieving the real property tax

burden on certain owners of land, (2) the program is administered by a state office, (3) a contract is required, (4) the parties to a contract are the landowner and the state, (5) the cost is shared among state and federal taxpayers, but not by local real property taxpayer, (6) the rollback taxes collected are devoted to a state-level development rights purchase program. There is a program for farmland and a program for open space. Only the farmland portion is referenced here.

With each part of the two-part program, the taxpayer must own qualifying land meeting one or more criteria set by the program. One part of the program applies the circuit breaker without the requirement of a contract. When a participant in this part computes his or her state income tax, he or she can receive a credit equal to 60 percent of any excess of farm property tax payments made above 3.5 percent of his or her taxable income. There is a maximum credit of \$1,200. "(A)ny surplus of credit in excess of the taxpayer's state income tax liability is paid (by the state) to the taxpayer."¹⁹ There is no interest computed or paid on this payment.

A second part of the program combines the circuit-breaker approach with a fixed-term, minimum-of-ten-years contract. This contract is executed by an owner of qualifying land with the state and a local government. The contract requires the land at issue to remain in agricultural use for the contract period, subject to certain penalties if the contract is broken. A contract may be terminated or renewed for a succeeding term of ten years. When a contract is in effect, the landowner receives a credit against his or her state income tax liability for any amount of his or her farm property taxes up to a maximum of 7 percent of the household's taxable income. A cash payment is paid by the state to the participating landowner for any surplus of credit in excess of state income tax liability.

The Michigan law provides that farmland means (1) a farm of forty or more acres, in one ownership which has been devoted primarily to an agricultural use, or (2) a farm of five acres or more in one ownership, but less than forty acres, devoted primarily to an agricultural use, which has produced a gross annual income from agriculture of \$200 per year or more per acre of cleared and tillable land.

An application to have land in the program is initially filed with the local governing body, which must notify the county (or regional) planning commission and the soil conservation district agency. Also, if

the land lies within three miles of the boundary of a city or one mile of a boundary of a town, the governing board of such town or city must be notified, and within thirty days such governing board must comment. After receiving comments, the board initially receiving the application must accept or reject the application. In the event, the board fails to act or rejects the application, the landowner may appeal to the state, and the state land-use agency has sixty days to accept or reject the application. An application may be rejected by the state land-use agency only for the reason that the land does not meet the definition of farmland.

When an application is accepted, a development rights agreement is executed. This must be for a minimum of ten years. The land is assessed for tax purposes at its fair market value. "The land is not exempted from local taxation", and the entire assessed fair market value is taxed at the local level.²⁰

Tax benefits to the landowner are derived through the state and federal income tax. The circuit breaker becomes effective when real property taxes exceed 7 percent of the household income. Household income includes "all income of all members of the household."²¹ Income "is roughly equivalent to gross income as defined by the U. S. Internal Revenue Code."²² The effect of this provision is substantially to narrow the benefits to those owners who obtain the greatest percentage of their income from farming, and also to distribute the benefits in geographic areas where owners have a high real property tax burden in relation to their household income. There were some 1.3 million acres in the Michigan program at the close of 1979. The average size tract involved is about 250 acres. Over 50 percent of the land accepted lies within metropolitan areas of the state.²³ Thus, the program is effective where the pressure on the land is generally greatest. Also, the Michigan law operates to permit local planning to take the contract(s) into account. However, the Michigan law does not provide for protecting the land through designated planning for agricultural land use.

This program has effectively worked (1) to ease the tax burden on eligible agricultural land lying in the edge of expanding metropolitan centers, (2) to share the cost of the program among payers of state and federal income taxes, and (3) to retain the real property valuation function in the hands of professionals.

The Wisconsin Law: Circuit Breaker with Agricultural Zoning and Planning

The Wisconsin legislature enacted a law designed to retain land in agricultural use. The law utilizes incentives and provides a tax-relief program.²⁴ The law provided that the program would be adopted in two phases. Because the first phase ends with the close of 1981, only the second phase is discussed here.

There are differing requirements for urban and rural localities. Whether a locality is urban or rural the documents to be adopted so the governing board can establish the exclusive agricultural zone and install the agricultural preservation plan must be reviewed by a state land preservation board and certified as meeting both law- and board-established standards. The area zoned for exclusive agricultural use need not be initially identical to that planned for such use. However, these are expected to coincide at some future date.

For an Urban County. For an owner of qualifying land lying within an urban county to become eligible for tax-relief benefits through income tax credits, the governing board must zone for exclusive agricultural use. This action qualifies owners of qualifying land lying within the exclusive agricultural zone for 70 percent of the maximum tax credit. If the governing board also adopts an agricultural preservation plan, an owner of qualifying land becomes eligible for 100 percent of the maximum tax credit. An owner of land lying within a participating urban county has fewer options than an owner of land lying²⁵ within a participating rural county.

For a Rural County. If a rural county adopts an exclusive agricultural zone, owners of land lying within the zone become eligible to enter into contracts to retain their land in agricultural use. Both the county and the state participate in the contract. Such a contract can range from a minimum of 10 to a maximum of 25 years. This contract makes the owner of the land at issue eligible for 70 percent of the maximum tax credit. If a rural county also adopts an agricultural preservation plan, an owner who also has contracted becomes eligible for 100 percent of the maximum tax credit. If such a landowner, the county, and the state agree to cancel a contract early, tax credits for not more than the preceding ten years are cancelled and must be repaid with interest. Therefore, the tax credits serve as a form of deferred

taxation. The contract "runs with the land" and is a feature involved in any sale of contracted land.²⁶

The extent of tax credit availability is related to household income. A household is defined as husband, wife, and dependent children under 18 years of age. Property taxes up to \$6,000 are eligible for relief. The maximum tax credit is \$4,200 on an eligibility of \$6,000. Any surplus of credit above taxable income is paid to the landowner by the state as a cash payment.²⁷

Within this policy, the new policies total at least seven: (1) the local governing board must act to initiate the agricultural preservation zone and the agricultural preservation plan, (2) the action by such board requires the cooperative support of owners of land identified for preservation by the zone and the plan, (3) there is no shift of taxes on the local level from those who own eligible land to those who own land and real property ineligible for program benefits, (4) many options--the total is more than 50--are made available to local governments by the program, (5) the land-use phase is administered by the local government with the concurrence of the state; the tax-phase is administered through the state department of taxation, (6) no special class of tax subjects must first be authorized by the state constitution, a necessary condition for the several forms of differential taxation, and (7) three forms of benefit are provided. These are (i) deferral of any repayment of tax credits or of cash payments received for any surplus of tax credit, (ii) forgiveness, that is, a "tax break", for any taxes deferred for any period the land remains in qualifying use in excess of 10 years, and (iii) tax-relief insurance that protects owners of eligible land against paying a high percentage of income for real property taxes in (abnormally) low-income years, such as drought years.²⁸

The landowners and, in turn, the counties of Wisconsin have made an overwhelmingly favorable response to this program. From the outset, the rate of participation exceeded that of all other initiatives to retain land for agricultural use. This is in part a measurement matter because all the land in the zoned areas established in response to the program is counted as participating in the program. Some owners may choose not to enter into the required contract. Therefore, they would not be eligible for tax relief.

The Wisconsin law is based on quite a range of experience, some of which is discussed in this paper. The program provides a system for calculating credits which operates so that "as income rises, tax

credits decrease; as property tax rises, tax credits rise also. This directs tax credits to younger farmers or others whose income is low compared to their taxes, and eliminate many high-income nonfarm investors."²⁹ Eligibility depends upon the landowner signing an agreement not to develop the land, or the land must be zoned for exclusive agricultural use. In a rural county, with exclusive agricultural zoning and with a farmland preservation plan, the landowner is eligible for 100 percent of the benefits.

Counties that desire to develop the required plans and develop the zoning are provided grants by the state. Within two years, over 1.5 million acres were zoned and over an additional 0.5 million acres were entered into contractual agreements.

In testimony before the United States Senate Select Committee on Small Business, Richard L. Barrows of the University of Wisconsin-Madison made this comment.

It is clear from the Wisconsin experience that new and effective agricultural land preservation policies can be developed by using traditional land use policy tools in a creative manner. In Wisconsin, we used a form of farmland tax relief (which virtually everyone agrees cannot preserve farmland alone) combined with an innovative use of zoning (which most critics regard as ineffective) combined with agriculturally-oriented land-use planning programs. The result is beyond dispute--most county governments have initiated significant planning programs, several have adopted and strictly enforced strong zoning, and the tax incentives seem to create a³⁰ climate favorable to local action.

The Wisconsin Taxpayer, published by the Wisconsin Taxpayers Alliance, reported in the November 1979 issue, that "(t)hat (the Wisconsin) Department of Revenue reports that approximately \$3.4 million in tax relief was distributed to farms during fiscal 1979. A total of 3,057 farmers received relief. The average tax credit was about \$1,112. This compares to 727 recipients of relief and an average credit of \$871 during fiscal 1978, the first year budgeted for the program."³¹

The Wisconsin program extended the New York agricultural district requiring collective action by landowners and the Michigan experience providing for use of state and federal tax credits, and added the requirement of collective action by landowners and government together with incremental incentives as the program progressed.

References

1. Greg C. Gustafson, "Land-use and Farmland Retention--The United States Experience", Agriculture in the Planning and Management of Peri-urban Areas, Vol. II, Organisation for Economic Co-operation and Development (Paris 1979). (Also see: Agriculture in the Planning and Management of Peri-urban Areas, Synthesis Report, Vol. I. Both volumes may be obtained from OECD Publications and Information Center, Suite 1207, 1750 Pennsylvania Ave., N. W., Washington, D. C. 20006.)
2. Thomas F. Hady and Ann Gordon Sihold, State Programs for the Differential Assessment of Farm and Open Space Land, Agr. Econ. Rpt. No. 256, ERS, USDA, (Washington, D. C., April 1974)
3. Public Acts of Michigan 1974, Act No. 116, May 23, 1974, as amended
4. Wisconsin Farmland Preservation Act, 1977, Wisconsin Statutes Annotated, Chapter 91, as amended.
5. Gustafson, op. cit., p. 701.
6. Ibid.
7. Maryland, Annotated Code (1960) Section 19(b), Article 81.
8. Ibid., (1969).
9. New Jersey, Laws of 1964, Chapter 48.
10. California Land Conservation Act of 1964, California Government Code Sections 51200-51295.
11. David E. Hansen and S. I. Schwartz, "Landowner Behavior at the Rural-Urban Fringe in Response to Preferential Taxation," Land Economics, Vol. 51 (1975), p. 352.
12. New York Agricultural and Markets Law, Article 25-AA, Agricultural Districts, Sections 300 to 309, (19791), as amended.
13. Code of Virginia (1950), as amended, sections 15.1-237 and 58-769.6 and Chapter 36 of Title 15.1.
14. Local Law No. 19, Local Law Relating to the Acquisition of Development Rights in Agricultural Lands, Suffolk County, New York, 1974.
15. Phillips Foster, Frank Schnidman, and Mark Bailey, Transferable Development Rights. University of Maryland, Cooperative Extension Service, EB 251 (1974).
16. John Costones, "Development Rights Transfer: An Exploratory Essay," Yale Law Journal, Vol. 83 (1973), p. 76.
17. Calvert County, Maryland Annotated Code, Article 5, Sections 273-282 (Supp. 1970).
18. Michigan Compiled Laws, Act No. 116 of the Public Acts of 1974, Setins 554, 701 to 544, 719.
19. Philip D. Gardner and Raleigh Barlowe, "Putting Michigan's Farm Real Property Tax in Perspective," Michigan Farm Economics, Michigan State University, Department of Agricultural Economics, No. 430 (November 1978).
20. Ibid.
21. Ibid.
23. Mark J. Cochran, Lawrence W. Libby, and Larry J. Connor, An Evaluation of Public Act 116 . . ., Michigan State University Department of Agricultural Economics, Report 42 (March 1977).
24. Wisconsin Statutes Annotated, Chapter 91, as amended.
25. Richard L. Barrows, "Wisconsin New Farmland Preservation Act: A Comparison With Other States" Economic Issues University of Wisconsin-Madison, Department of Agr. Economics, No. 13 (September 1977).
26. Ibid.
27. Ibid.
28. Ibid.
29. Ibid.
30. Richard L. Barrows, "Farmland Retention Policy: The Wisconsin Experience and the Federal Role," testimony before the United States Senate Select Committee on Small Business (Washington, D.C.; July 10, 1979).
31. The Wisconsin Taxpayer, 47:11 (November 1979).

EXAMINING SOME PUBLIC LAND-USE PROTECTION AND PRESERVATION
INSTITUTIONS: ZONING AND OTHER REGULATORY AUTHORITY

Keith J. Buttleman#

Protecting and preserving rural land uses, particularly productive agricultural uses, is a subject that has been receiving increasing attention in recent years in all parts of the nation. Recognition of the fact that land resources are being lost to non-agricultural uses has made the issue of agricultural land preservation a cause celebre in many localities. Reasons behind this phenomenon, whether real or perceived, and the validity of some of the motives behind agricultural land preservation, have been discussed elsewhere. A basic assumption of this discussion is that land preservation can be a valid objective of society in general and many local governments in particular.

As a result of this nationwide interest in slowing or preventing the loss of agricultural land, a number of new concepts have been developed and translated into legal mechanisms. Some of these are in use in Virginia. Primary among these are various forms of differential taxation (use-value taxation in Virginia) and agricultural (land protection) districts. (Virginia's agricultural district law is modeled closely on the New York approach.) The specific topic of this paper is the use of zoning and other traditional land-use controls, mainly subdivision control, as a means of agricultural land preservation.

For several reasons, zoning and subdivision controls have been overlooked, or at least not extensively used, in efforts to preserve agricultural land. Some of these reasons will be addressed below. In this article, we will discuss some ideas on why two of the most basic tools in local governments' arsenal of land-use planning and regulatory tools have not been generally applied to the preservation of agricultural land. Further, this article will address how these two mechanisms can be used. By way of illustration, a particular case in which zoning has been used as an integral part of a sophisticated state agricultural land

preservation effort, Wisconsin's Farmland Preservation Program, will be summarized.

The theme of this article is that traditional zoning and subdivision controls, while seemingly ineffective for agricultural land preservation when traditionally applied, may be quite effective when approached in a nontraditional manner.

Why Zoning Has Been Ineffective

There may be a large number of reasons why zoning does not seem to be effective in agricultural land preservation efforts and, therefore, why zoning is often discarded or overlooked in favor of more exotic measures. Among these reasons are the three closely related ones mentioned here. First, zoning is not, or at least did not start out to be, a rural land-use control mechanism. Zoning originated in an urban setting as a means of dealing with conflicts among urban land uses. As long as development of land for more intensive uses did not extend into the rural, agricultural areas on any large scale, the need for zoning was not apparent. Even in many localities today (thirty-nine out of Virginia's ninety-four counties), zoning has not been adopted.

A second reason--and one which flows from the first--is that when counties do enact zoning, the obvious focus tends first to be on the most highly developed areas and on intensive uses, and on "undeveloped" land last. Agricultural land, even if highly productive, tends to be considered "undeveloped". This attitude fails to account for the fact, that in most cases, good farmland was developed for agricultural purposes precisely because it is good for growing things. Where agricultural production is a major factor in a local

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economy--and this is still the case in a remarkable number of Virginia's counties, even some urbanizing ones--agricultural use may be the "highest and best" use, especially from the overall public-interest perspective. As long as the attitude which holds that, in the zoning ordinance, agricultural zones are those areas left over after having designated all other land-use zones, zoning cannot possibly be effective in dealing with agricultural land preservation.

A third reason for the relative ineffectiveness of traditional zoning approaches in agricultural land preservation is the inability (or unwillingness) of many local governments to resist pressures to rezone parcels for development upon request and regardless of where development is proposed as long as there is no great local controversy over the matter. When agricultural land is proposed for development, especially of the type that eats up farmland in a piecemeal fashion, there is usually no local opposition comparable in resources, desire, or intensity to the proponent of the rezoning.

Why Zoning Should Be Effective

Despite these very significant reasons why zoning, as traditionally implemented, has generally not been looked upon favorably as a means of agricultural land preservation, there is some reason to believe that zoning, in theory at least, should be able to be used toward such ends in Virginia. There are a number of provisions in state law and the Virginia Constitution which lend support to the ideal of agricultural land preservation in general, and its accomplishment through zoning in particular. Article XI of the Virginia Constitution states that ". . . it shall be the Commonwealth's policy to protect its atmosphere, lands, and waters from pollution, impairment, or destruction, for the benefit, enjoyment, and general welfare of the people of the Commonwealth." (Emphasis added.) This language is considerably stronger, on the side of public interests in conservation and environmental protection, than was the language originally proposed by the Commission on Constitutional Revision.

Section 15.1-427 of the Code of Virginia, as amended, which declares the legislative intent in enacting enabling legislation for "planning, subdivision of land and zoning", states that one of its

purposes is to encourage local governments to plan "to the end . . . that the needs of agriculture, industry and business be recognized in future growth. . .". (Emphasis added.) In defining "zoning", section 15.1-430 of the Code says that zoning includes prescribing ". . . uses to which land . . . may be put". Certainly, agricultural uses are among these. In describing "the comprehensive plan", section 15.1-446.1 states:

The comprehensive plan shall be made with the purpose of guiding and accomplishing a coordinated, adjusted and harmonious development of the territory which will, in accordance with present and probable future needs and resources best promote the health, safety, morals, order, convenience, prosperity and general welfare of the inhabitants.

Planning for agricultural land preservation, especially in counties whose economies rely heavily on agriculture, certainly seems to be justified and even required by this language. This section of the Code goes on to list agriculture specifically as one of several land uses for which areas should be designated. Even more to the point, section 15.1-486, dealing with zoning ordinances generally, lists as the purpose of such an ordinance to ". . . regulate, restrict, permit, prohibit . . . the use of land, buildings, structures and other premises for agricultural, business, industrial, residential, floodplain and other specific uses. . .". (Emphasis added.)

Although there are numerous other citations that could be made of statutory wording that supports the use of zoning in agricultural land preservation, one additional quote should suffice to make the point here. Section 15.1-490 contains this statement.

Zoning ordinances and districts shall be drawn with reasonable consideration for . . . the comprehensive plan where adopted, the suitability of property for various uses, . . . the current and future requirements of the community as to land for various purposes . . . ; conservation of natural resources; . . . and the encouragement of the most appropriate use of land throughout the county or municipality.

Inasmuch as "the most appropriate use" of much of Virginia's land is for agriculture, this section fairly clearly points to zoning as an appropriate mechanism for maintaining such "appropriate use".

After Determining Can, the Question is, How?

The question seems to be not so much whether a zoning ordinance can be used by a local government in its efforts at agricultural land preservation, but rather one of how should such an ordinance be used. Further, the question should consider how zoning might be linked to other mechanisms (such as differential taxation) to strengthen their mutual effectiveness.²

An illustration of a program that does these very things may serve to suggest possible similar applications in Virginia better than continuing to discuss the issue on a theoretical basis. The Wisconsin Farmland Preservation Program presents an interesting case study of a system which successfully combines agricultural zoning ("exclusive agricultural districts") and a property tax relief program. The taxation arrangement is unique in that it is based partially on income tax rather than exclusively on property taxes. Attached as an appendix to this paper is an article which describes Wisconsin's Farmland Preservation Act and program.³

Legal Precaution with Zoning

In any case in which a local government attempts to use police power delegated to it by the state, certain legal precautions must be carefully considered. Both substantive and procedural due process must be followed, and, in zoning cases especially, the "taking" issue may arise. Also critical, in any attempt by a locality to promote a land-use status quo or preserve certain existing uses, the equal protection question must be considered. Zoning that is exclusionary in nature, whether intended to be or not, may be struck down on these grounds, as may zoning which treats similar classes or persons, uses, or situations differently without reasonable justification. Those seriously interested in using zoning (or any other land-use control) for agricultural land preservation purposes must look beyond statutory law and give careful attention to the body of Virginia case law on the subject.

Another legal consideration, especially for those interested in using new land-use techniques, is the possible need for additional enabling legislation. Even given the endorsement of agricultural land preservation as a function of zoning under current statutory law in Virginia (as cited above), attempts to use zoning in non-traditional ways, such as in Wisconsin's approach to exclusive agricultural districts, would be significantly strengthened by new

enabling law passed specifically for that purpose. The Dillon Rule⁴ is alive and well in Virginia, and, given the failure of attempts to overturn the Dillon Rule when the current state Constitution was drafted and debated in the years 1968 through 1970, it seems to be here for some time to come. The lament by some localities that they cannot function well under the current legal situation seems to raise moot points. For the present, at least, enabling legislation for such new measures seems to be a wise approach.

Several conclusions seem appropriate. The fact that these are the opinions of the author, and are thus fairly debatable, should be obvious. They most definitely should not be taken as expert opinions.

1. The exclusive agricultural district within a local zoning ordinance may offer a strong legal mechanism for agricultural land preservation efforts and can probably be implemented under current state enabling law.
2. Differential taxation (tax breaks as available under use-value taxation) probably cannot be linked to the use of exclusive agricultural districts, as they are in the Wisconsin program, under current enabling law. Certainly, the concept of a graduated tax-differential based upon income taxation is not authorized under Virginia law.
3. Specific state enabling legislation would ensure the ability of local governments in Virginia to use zoning techniques for agricultural land preservation.
4. Any use of the police power which has been delegated to localities must be applied fairly and carefully as prescribed by statutory and case law.
5. Most critical to the success of any agricultural land preservation effort, a local government and its citizens must know what they want to do (that is, they must know their objectives), why they are motivated to want to do it, and how to do it. Above all, they must agree that agricultural land preservation is worth pursuing and, then, follow through with a strong commitment.

Notes

1. For a discussion on the potential implications of Article XI of the Virginia Constitution, especially its "public trust" aspects, see A. E. Dick Howard's, Commentaries on the Constitution of Virginia.
2. This discussion is focused primarily on zoning. Subdivision ordinances cannot be considered prescriptive of land uses in the same sense that zoning ordinances are. The implementation of subdivision ordinances is administrative in nature, whereas zoning decisions by local governments are considered legislative actions. Therefore, much wider discretion is allowed localities through the use of zoning. In the case of subdivision controls, the lot size threshold under which the ordinance applies is probably their most significant feature with respect to agricultural land preservation. Other than that, subdivision ordinances should

be considered mainly as providing specific monitoring and administrative enforcement of minimum lot-size and maximum density provisions of zoning ordinances.

3. Professor Barrows has written a number of articles on various aspects of this program. Two are especially interesting: "Mapping to Preserve Agricultural Land" and "Zoning to Preserve Agricultural Land".
4. Enunciated by Judge John F. Dillon in Commentaries on the Law of Municipal Corporations (1873), the Dillon Rule holds that the powers of local governments are limited to those expressly granted by the state. Under this rule, whenever doubt exists as to whether a locality has a certain power, the courts will rule against the locality. The result is that a locality must seek state enabling legislation for every new power it wishes to use.



Wisconsin's Farmland Preservation Program

Richard Barrows

The Farmland Preservation Act was passed to assist local people who want to preserve farmland, and to provide tax relief to farmers who participate in the local programs. The success or failure of the program rests in the hands of farmers, local citizens, and local elected officials. There are many options for local government under the law, and the state will not dictate local planning and zoning policies—those policy choices are the proper business of local citizens and local government. The Farmland Preservation Act will assist local governments in what they decide to do, but the decisions must be made by local citizens. The information in this publication is based on the law as amended in 1978. A major change involves the tax credit schedule shown in the table. If, after reading this publication, you need more information on the Farmland Preservation Act, contact your county office of University of Wisconsin—Extension, usually located in the county courthouse; or write the Wisconsin Department of Agriculture, Trade and Consumer Protection, P.O. Box 8911, Madison, Wisconsin 53708.

On June 29, 1977, Wisconsin's Farmland Preservation Act became law. The purpose of the new law is to help local governments that want to preserve farmland through local planning and zoning, and to provide tax relief to farmers who participate in the local programs. The program offers many options for farmers and for local governments. It is important that people understand the facts about the new program in order to make well informed decisions for their family and their local community.

Under the new farmland preservation program, farmers can qualify for tax credits in either of two ways: (1) their land is zoned for exclusive agricultural use; or (2) they sign a contract agreeing not to develop their land for a specific time. There are two stages to the program: The first stage runs until 1982, and the second stage begins in 1982 or before, depending on action of the local governments.

THE INITIAL PROGRAM

In the first five years, 1977-1982, or until the county enters the second stage of the program, any farmer in the state can qualify for tax credits by voluntarily signing an initial contract. The farmer agrees not to develop his land and in exchange is eligible for state income tax credits.

The Contract

To qualify for a contract, the farmer must have 35 acres or more in a parcel, and the land must have produced a value of farm product of \$6,000 in the last year or \$18,000 in the last three years. "Value of farm product" means the gross receipts from the land's agricultural use, not counting rent and the initial cost of livestock or other items which are bought and then resold. A person who rents out his land can easily qualify to sign a contract, if the land produced the required value of farm products. Also, to qualify to sign a contract, the farmer must either have an SCS farm conservation plan or request that a plan be prepared by the local soil and water conservation district and SCS.

The farmer applies to the county board for a contract, by filling out an application and giving it to the county clerk. The clerk notifies several local government agencies, including the town board, and these groups have 30 days to give any comments to the county board. In most counties, a county board committee will review the application and make a recommendation to the county board. The full county board approves or rejects the application, but the farmer can appeal a rejection to the state Agricultural Land Preservation Board. If the county approves the application, the state must sign a contract with the farmer if the land is qualified under the law.

Under the contract, no development is allowed unless it is for farm use. Farmers are eligible for income tax credits, and are exempt from special assessments to provide urban-type public services such as sewer and water. The contract follows the land, even if the land is sold. The initial contract expires on September 30, 1982.

Tax Credits

Farmers whose land is included in the program are eligible for tax credits against their state income tax. The income tax credit is based on household income. A household is a husband, wife, and dependent children under 18 years old. Families in farm partnership or farm corporations under Subchapter S are treated the same as any other household. The household's income includes: the *net* farm income; any non-farm wages, salaries and tips above \$7,500; and other miscellaneous sources of income. The tax credit is calculated by a very detailed formula. Property taxes up to \$6,000 are eligible for relief and the maximum credit is \$4,200. Basically, the higher the property tax, the higher the tax credit, *and* the lower the income, the higher the credit.

The level of tax credits also depends on whether the county has an agricultural preservation plan, exclusive agricultural zoning, or both. The table below shows the *maximum* tax credit. Farmers with initial contracts receive 50% of the maximum credit. Farmers whose land is in an exclusive agricultural zone are eligible for 70% of the maximum credit. If the county has an agricultural preservation plan, farmers are eligible to sign a second-stage contract and receive 70% of the maximum credit. If the county has both planning and zoning, farmers are eligible for 100% of the maximum credit. More details about the planning and zoning are discussed under the second stage of the program.

MAXIMUM TAX CREDIT SCHEDULE*

Income\$	Property Taxes:					
	\$1000	\$2000	\$3000	\$4000	\$5000	\$6000
0	900	1800	2500	3200	3700	4200
5000	900	1800	2500	3200	3700	4200
10,000	675	1575	2325	3025	3575	4075
15,000	360	1260	2080	2780	3400	3900
20,000	0	855	1755	2465	3165	3675
25,000	0	180	1080	1940	2640	3300
30,000	0	0	0	855	1755	2465
35,000	0	0	0	0	180	1080
40,000	0	0	0	0	0	0

*Actual credit received by farmers: Initial contract = 50% of these amounts; exclusive agricultural zoning = 70% of these amounts; zoning plus an agricultural preservation plan = 100% of these amounts.

An initial contract expires naturally in 1982. If the land continues in the program, there is no payback of tax credits. If a farmer is not eligible for the second stage of the program because the county board failed to qualify his land, then he pays back the last two years of tax credits. In this case there is no interest, before or after 1982. If the farmer's land *is* eligible for the second stage under a county agricultural preservation plan but he chooses not to sign another contract after 1982, he must pay back all the tax credits received. In this case there is no interest before 1982, but 6% annual interest on the payback amount if it is not paid in 1982. If a contract is canceled early, before 1982, the landowner must pay back all the tax credits plus 6%

interest from the time the credit was received. In all cases the payback amount need not be paid immediately, but must be paid if the land is later sold or developed. *If the farmer signs a new contract or is in an exclusive agricultural zone, there is no repayment of tax credits.*

THE SECOND STAGE PROGRAM

The second stage of the program begins in 1982 or before if a county adopts agricultural zoning or planning. Tax credits after 1982 depend on what the local government does. In order for farmers to remain eligible for tax credits, counties must take some action. Counties are not required to do *anything*, but tax credits depend on some county action. *Counties could act earlier if they wish, but by October, 1982.*

1. Urban counties—in counties with a population density of 100 or more people per square mile, the land must be under a certified exclusive agricultural zoning ordinance to be eligible for credits.

2. Rural counties—in counties with population density less than 100 people per square mile, the land must be under either a farmland preservation plan or an exclusive agricultural zoning ordinance to be eligible for credits.

Agricultural Zoning

Farmers may also qualify for tax credit through local exclusive agricultural zoning. If the local zoning meets the standards in the law for protecting farmland, then farmers may qualify for tax credits without signing a contract. Exclusive agricultural zoning ordinances must provide that farmland cannot be developed, and no residences can be built unless occupied by the farmer, his parents or children, or a person working on the farm. Other than for these exceptions, the minimum parcel size for a residence is 35 acres. Special exceptions and conditional uses, such as a farm implement dealer or a roadside stand, must be compatible with farming. Rezoning the land to allow development is a local decision. In making the zoning decision, local officials should consider whether the new development would increase public service costs for local people or would harm nearby farms or the local environment.

By early 1979, several counties had already adopted exclusive agricultural zoning ordinances, including Barron, Columbia, Dane, Iowa, Jefferson, Shawano, and Walworth. Several other counties were working to amend their zoning ordinances to provide for exclusive agricultural zoning. When such an amendment is adopted by a county, each town decides for itself whether to accept or reject the exclusive agricultural zoning for that town. In a few urban counties which do not already have county zoning (such as Brown, Fond du Lac, Rock, and Sheboygan) an exclusive agricultural zoning ordinance could be adopted only by a majority vote of all the towns in the county. So, exclusive agricultural zoning must be a partnership between the towns and the county.

Agricultural Planning

Agricultural preservation plans (Ag Plans) are similar to the land use plans which have been in effect in many counties for a long time, except the entire idea of the plan is to help preserve farmland. The plan must be based on background studies of the county's agriculture,

natural resources, and population growth. The plan should also state the county's policies on preserving farmland, providing for urban growth, and protecting the local environment. Importantly, the Ag Plan should also contain maps of which agricultural lands should be preserved, and a proposed program to preserve farmland. Plans are not binding on landowners or the county, but are useful guides for future local decisions. Farmers whose land is in an agricultural preservation district in the Ag Plan may sign contracts similar to the initial contracts. It is important that farmers and other local citizens be involved in the planning process from the very beginning.

Tax Credits

In *rural counties*, a farmer whose land is in the exclusive agricultural zone is automatically eligible for tax credits at the 70% level without any contract. If the county has an Ag Plan, but no zoning, farmers in a preservation district under the county's plan may voluntarily sign contracts. The contract is similar to the initial contract except that it is for 10-25 years and the farmer is eligible for 70% of the maximum tax credit. If the county has both zoning and a plan, farmers are eligible for 100% of the maximum credit. If a county has an Ag Plan, and if allowed by traditional zoning procedures, *towns* could adopt exclusive agricultural zoning ordinances and qualify farmers in the zones for 70% of the maximum credit.

In *urban counties*, farmers are eligible for tax credit only if their land is zoned for exclusive agricultural use. Zoning would qualify them for 70% of the maximum credit, but if the county has both exclusive farm zoning and an Ag Plan, farmers are eligible for 100% of the maximum credit. Under some special conditions, if a county has an Ag Plan and if allowed by traditional zoning procedures, farmers may be eligible for tax credits under town exclusive agricultural zoning at the 70% level of credit.

If a contract expires and no new contract is signed, the farmer is responsible for repaying the tax credits received over the last 10 years. Or, if land is removed from the exclusive agricultural zone, the owner is responsible for repaying the tax credits over the last 10 years. In either case, there is no interest, unless the credits are not repaid at the time the contract expires or the land is rezoned. If the payment is not made until later, there is 6% interest in the meantime. The payback is due when the land is next sold or developed. If the farmer, county and state agree to cancel a contract early, the payback is the tax credits over the last 10 years, plus 6% interest from the time the credit was received. *If a farmer continues in the program by signing a new contract, or the land is in an exclusive agricultural zone, no credits are repaid.*

Local Option

There are options for county and town governments under the farmland preservation program. First, no county is required to have zoning or planning. However, after 1982, tax credits will be available to farmers only if their land is in a county plan preservation district or in an exclusive agricultural zone. Even if the county acts, town government and landowners still have many options. County Ag Plans are not binding on landowners or governments, and the plan can be modified if there is good reason. Contracts are

voluntary for farmers.

Zoning is optional for the county and town governments, but, of course, any local zoning is binding on the landowner. In most counties, towns have an individual town veto over whether any new farm zoning provisions in the county zoning ordinance will take effect in that town. In a few urban counties, adoption of county exclusive agricultural zoning can take place only with the agreement of a majority of towns, basically the same way zoning changes have always worked. Finally, under certain conditions, towns may be able to adopt exclusive agricultural zoning ordinances and qualify farmers for tax credits. By early in 1978, the Walworth County Ag Plan was certified, enabling the Town of Lafayette to qualify farmers for credits by town exclusive agricultural zoning. However, higher levels of credit would be available to town farmers through county zoning.

Administration

Both the initial and the permanent programs will be administered by the Wisconsin Department of Agriculture, Trade and Consumer Protection. A special State Agricultural Lands Preservation Board is created to *certify* that exclusive agricultural zoning ordinances and preservation plans are consistent with standards in the law. The Board also acts on requests for early termination of contracts, acts on appeals from farmers who were denied contracts by the county, and approves spending of funds for counties to develop preservation plans. The Board is composed of the secretaries of the State Department of Agriculture, Trade and Consumer Protection; Administration; Local Affairs and Development; and two public members appointed by the Governor and approved by the State Senate.

Effect on Farmers

The new law will affect farmers in two ways. First, local planning and zoning can protect farm operations from interference from urban land uses. When farm and urban land uses are mixed, land use conflicts often arise over farm odors, noise, or dust, and there are sometimes conflicts over fence maintenance and trespass. Exclusive agricultural zoning by local governments could help reduce these conflicts by separating farm and urban land uses. Farmers are also protected from special tax assessments for sewer, water, or other urban public services. Exclusive agricultural zoning will also help reduce the cost of public services and keep farm property tax assessments from rising as rapidly as they would if nearby farmland were being developed.

Farmers are also eligible for tax relief, but two points must be noted. First, the tax relief depends on the farm family's income. When income is low, tax credits will be high; when income is high, tax credits will be low. In effect, the tax relief is more like an *insurance policy* than a pure across-the-board tax cut. The tax relief program is insurance against a bad crop year or any other event that reduces farm income.

Second, the tax relief is a pure tax break only if the land stays in farming. The program offers only tax *deferral* if the land is developed. As long as the land stays in agriculture or open space use, there is no reason not to remain in the program, so no tax credits are repaid. So if the land stays in farming, the program offers a tax break. But if the

land is removed from the contract or zoning, and is then sold or developed, some tax credits must be repaid. In effect, the property taxes were *deferred* until the land was sold or developed. And, of course, the payback period might not cover all the years when tax credits were received, so there would be some pure tax break and some tax deferral. In the worst case, when all the credits must be repaid, the tax relief amounts to an interest-free loan for the period the land is zoned or under contract (or a loan at 6% interest if a contract is terminated early). So, the new law offers a pure tax break to those who keep their land in farming. To others, the law offers tax deferral, with possibly some pure tax break as well.

Many farmers ask "How do I know whether to sign up?" This must be decided by each individual farm family, but there are several questions which are helpful for the farmer to ask himself. First, he should ask "Do I want to develop my land, and will I be able to develop, between now and 1982?" If the farmer wants to develop and has a good chance of doing so by 1982, then he should be extremely cautious about signing a contract in which he agrees not to develop. A contract can be canceled only with the agreement of all parties—the farmer, the county, and the state.

If the farmer does not want to develop, or has no real chance to develop, then he needs to ask a second question: "How much tax credit would my family receive?" If there is no credit, there may be little reason to sign a contract. *Each individual farm family must calculate the credit for*

its own specific situation. The credit will vary from \$0 to \$4,200 per year, depending on the family's situation. If there is some credit available, then the last question is: "What will be the payback in 1982?" If the land continues in the program through local zoning or a new contract, there is no payback. If the county fails to qualify the land, the payback is the last two years of credits. If the land is eligible for a new contract, but the owner chooses not to sign up (probably because of his wish to develop), then the payback is the full amount of credit received. At worst, the tax credit amounts to a tax deferral; at best it is a pure tax break. Each individual farm family must ask these questions and determine the answers for its own situation, because some families will receive substantial benefits, while others may receive very little. The decision must be made by each farm family.

Effect on City People

The Farmland Preservation Act may benefit urban residents by preserving open space, by helping to preserve farmland for the future, and by helping to control urban sprawl and reduce the cost of extending public services to new developments. Since the tax credit does not affect the property tax collected by the local government, the program will not increase property taxes for urban people. However, everyone in the state will pay for the program since it offers farmers a credit against the state income tax. However, the total cost of the program is likely to be quite small, especially in the early years when there are few contracts signed.

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DENSITY TRANSFER: HOW IT'S WORKING; A DECADE OF EXPERIMENTATION

By Peter J. Pizor#*

A Challenge to Communities

The explosive growth of metropolitan areas in the past two decades caused widespread loss of farmlands, environmentally sensitive areas, and historic sites. Recently, this has been augmented by the resurgence of growth in non-metropolitan America (Beale, 1975*). In addition, members of the post-war baby boom cohort are now reaching the prime house-buying years of their late twenties and early thirties. As long-term housing demand increases, pressure on the land resource and historic sites must mount as well.

Loss of open space is not the only consideration. The typical suburban development pattern in the United States is very inefficient in terms of its use of land. Low-density development patterns have been indicted as being energy inefficient (Real Estate Research Corporation, Costs of Sprawl).

At present, land development is the result of a large number of decisions made by developers and builders, under guidelines elaborated by local governments. Those municipalities that sought to mitigate sprawling development and preserve open-space or historic sites have typically faced three options (B. Budd Chavooshian, 1979).

First, land may be kept from the development process by municipal purchase. This is possible using the power of eminent domain, but, as development pressures drive up the price of land, such an option becomes

increasingly expensive. Paradoxically, this works against farmland preservation in those areas where farmlands are most threatened. For, where growth is imminent, few municipalities will be able to afford to purchase the large contiguous tracts of land necessary to sustain farming.

A second option, zoning the land at very low densities, is superficially attractive. Yet, upon examination, large-lot zoning fails to preserve farmlands or historical sites. Moreover, the use of extremely large-lot zoning transfers the costs of preservation to private landowners.

A third option, density-transfer, is a hybrid which seeks to resolve the dilemma between regulation and purchase. Communities in all sections of the United States have been experimenting with density-transfer programs over the past decade. While the programs differ significantly in approach, coverage, and effectiveness, they serve as early experiments in innovation.

Density-transfer Explained

The density-transfer premise is simply stated. If the potential for development of a given site could somehow be shifted and added to the permissible development on another site, both preservation and development could be accomplished. This is not as contradictory as it appears. A legal development framework is established on each buildable lot by the provisions of an applicable zoning ordinance. Before any development takes place, the potential (actually the number of legally-permissible building permits under the present zoning) for development is shifted to another site. The result is analagous to the commonly used

*See notes, page 55.

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technique of clustering raised to the community scale. Using density-transfer programs, very large tracts of open space, farmland, historical sites and the like, can be preserved.

Although some two-dozen communities have adopted transfer programs, a smaller number have actually experienced transfers. Transfers have been slow in developing because cautious sellers await more information on the market for rights. However, transfers have taken place in the first communities to adopt the concept. New York City, with years of experience and judicial review of its program, had a flourish of development rights activity in 1979. Sales of development rights have also taken place in Bucks County, Pennsylvania, in Collier County, Florida, in Southampton, New York, in California, and elsewhere.

Many of the communities to first adopt density transfer felt they had initiated the concept, and as might be expected, the ordinances have an experimental quality to them. However, the collective experience with the transferable development right (TDR) is now quite large and a collection of ordinances prepared by municipalities in eight states has been published (Pizor, Nieswand, and Swanson, 1979). The experiences of three different types of communities and their approach to density-transfer are presented below. The examples were chosen to illustrate urban, suburban, and rural uses of a TDR, rather than municipalities with the largest number of transfers.

An Urban Resolution

In 1956, the Columbia Historical Society, a nonprofit organization devoted to studying the history of Washington, D.C., was given a four-story brownstone on Dupont Circle. They established the Christian Heurich Memorial Mansion and the adjoining walled-gardens which are reminders of the residential character of this now bustling commercial neighborhood. The Historical Society, while appreciating the elegance of the building, was hard pressed to maintain it. Some repairs were underwritten by an early president of the society, but, over the years, the cumulated deferred maintenance was taking its toll.

Changes were taking place in the neighborhood as well. Adjacent blocks were increasingly desirable as addresses for a host of national organizations and

professional offices. The announcement that a stop on the Washington Metro would be near DuPont Circle gave further impetus to rising property values in the area and increased the need to decide about the Mansion.

Faced with the need to maintain the building, and realizing the windfall they could receive from its sale, caused much discussion among society members. Under the District of Columbia zoning ordinance, the existing building could be replaced with a newer, larger, and, in all likelihood, more profitable structure. A local attorney was familiar with the density-transfer plan developed by John Costonis for Chicago and wondered if there were any ways the Society could sell its right to develop the site while retaining the building (Costonis 1974). Coincidentally, at the far end of the same block, a property owner was seeking approvals for a new office building. The attorney proposed a compromise: the Columbia Historical Society would sell the unused portion of its development rights to the developers of the office building. The one-time sale of the development rights would produce an amount of equity that could be used to maintain the structure. At the same time, given the high demand for office space near metro stations, the developer of the new office building could profit by increasing the height of the proposed office building by two stories. Both parties could demonstrate that no more total development would take place than if each developed separately. However, by cooperating with each other, the transfer would preserve both the Mansion and its gardens. They agreed to present a joint application to the Washington, D.C., Planning Commission. Their application claimed that the existing planned-unit development section established total-bulk standards but allowed flexibility in establishing the heights of buildings. This provision, they contended, provided enough support for the transfer. Contingent on zoning approvals, the parties agreed to transfer by sale 82,000 development rights (each equal to a square foot of floor space) for \$550,000.

The arrangement was contested by nearby homeowners who were opposed to any further commercial development in the area, but it was finally sanctioned by the District of Columbia Court of Appeals. The court noted that planned-unit development rights were transferable and that zoning could be used to promote historic preservation (DuPont Circle Citizens Association v. District of Columbia Zoning Commission, 355 A. 2d 550).

The result of the transfer is the preservation of the Heurich Mansion and the addition of two stories to a nearby office building. The costs of preserving the structure were not borne by the city, but

came through the ability of the Columbia Historical Society to sell some of its unused assets on the open market to a willing buyer.

A Suburban Resolution

Planners in the predominantly rural Hillsborough Township of New Jersey were faced with rapid growth. Construction of sewers and an ample supply of water, coupled with the town's proximity to work centers in the New York metropolitan area, led to the proliferation of housing developments. Within a few years, farm fields were being replaced by new houses, apartments, and the other appurtenances of suburban life. Local planners and officials were concerned that all farmlands would eventually be converted to developed uses. Others expressed concern about the costs of sprawl developments.

Working closely with its planning consultant, the township developed a density transfer section for its ordinance. A bonus zone was delineated in a portion of the town suited for relatively high development. The location of this zone was selected because sewers and water lines were installed in the area and the general pattern of development was in that direction. Developers were permitted to construct one or two dwellings per acre above that normally permitted if they would agree to permanently restrict development on lands outside the growing town-center and then give the preserved acreage to the township. The township intends to preserve such lands from development and presently intends to lease the preserved acreage back to local farmers, thus continuing the acreage in agricultural production.

The number of credits that can be transferred is equal to the number of houses that could have been built on the agricultural land under the existing zoning regulations. Thus, a 100-acre tract zoned for 3 acres per lot would yield a total of 33 development credits. In addition, where environmental constraints, such as a high water-table or steep slopes, were a factor, this total would be proportionately reduced. The 33 credits could be added to a subdivision in the appropriate development zone, subject to a stipulation that enables the township to set an upper limit on the final density that can be achieved. Thus, if the base zoning allowed a density of four units per acre, the bonus obtained by using transfers could reach six units per acre.

As in the District of Columbia, buyers and sellers for development rights have appeared. While the first attempt was defeated by the complexity of township regulations, a second transfer has taken

place. An area farmer wanted to subdivide the 100-acre family farm. However, instead of building houses, two parcels were created. One sold as a "gentleman's farm" with room on its 30 acres for a house and some horses. The remaining 70-acre parcel was sold to a developer who was building townhouses 8 miles away in the township center. After allowances for the capacity of the land and the zoning applicable to the parcel, 18 development credits were issued for the land and transferred to the town center to become an equivalent number of townhouses. Absent the development credits, the land will serve as permanent pasture land.

The original seller received the open-market price for the land, the existing farmer and the new gentleman farmer are both guaranteed permanent open space, and the total number of housing units constructed was unchanged--only their ultimate location shifted. Thus, the transfer neither increased nor decreased the potential housing stock of the township. Rather, it was clustered in the town center and helped preserve the first link in a permanent green belt. Additionally, by creating a more compact settlement pattern, such cost factors as sewers, water lines, and school bus routes were kept somewhat shorter, thereby providing a small but continuing measure of cost containment for the community.

The town hopes to rent the land for pasture at an amount that would equal to the amount of tax revenue it would have previously generated under New Jersey tax abatement for agricultural lands. Moreover, the newly constructed townhouse units are being taxed as developed land.

A Rural Resolution

Another community, St. George in Vermont, was faced with a similar dilemma. Nestled into a steep Vermont valley 15 miles from the bustling city of Burlington, St. George had very little flat land suited for development. The governing body purchased a tract of land that was located in the center of the valley that contained much of the best flat land remaining for development. The local officials hope to negotiate with prospective builders who must buy land on the slopes. Development can most efficiently take place in the center. Those desiring to develop in the center will be requested to purchase land on the mountain sides and then exchange it for the right to develop in the center. Although no sales have taken place, the town has installed a well and awaits a buyer. In the meantime, this land is farmed by the community's only farmer.

TDR as a Model

A thread of consistency runs through each example presented. Local officials were seeking a way to control growth in their communities without the inequities of harsh regulation or the costs of extensive land purchase. These programs are early attempts at establishing transfer-of-development-rights programs. They reflect, albeit imperfectly, a model of a land-use development initiated by Chavooshian and others (Chavooshian, et. al, 1974, Costonis, 1974, and Nieswand, 1976). As developed over the past decade, the classical TDR model consists of these components:

1. A transfer district that can absorb relatively higher levels of density.
2. An area for preservation that can be devoted to either farmland, open space, or developed uses, such as historical landmarks.
3. A means of defining the the amount of development that a development right, credit, point, or other measure is worth.
4. A means of permitting the sale and purchase of development rights.
5. The operation of a development rights bank that can buy or sell land either with or without development rights as well as purchase and re-sell the rights.

A development right may be defined as the difference between a parcel's existing development and its potential development, considering all pertinent development regulations. This potential development is often expressed in terms of units or rights in residential terms, each one being the equivalent of one building-permit. In commercial applications, the rights may be expressed as so many buildable square-feet. A development right is given specific meaning only in terms of the applicable zoning restrictions. The value of the development right is more complex and, as with other forms of real estate, its value will be determined by the overall demand for development in the area as modified by the particular characteristics of the possible transfer sites.

A Note of Caution

The TDR is a process whereby public goals are accomplished by creating a measure of flexibility in an essentially open market operation. Where the development market is generally weak, the market for development rights is correspondingly weak. If the market for development in the transfer-in districts does not exist, the value of development rights can fall. Where the

market is very strong, the value of such rights can rise. Thus, the key to stimulating transfers lies with an understanding of the dynamics of the regional housing market.

Tailoring Density-transfer to Specific Communities

Density-transfer is a planning tool and works most effectively in a context where local leaders have a clear set of planning priorities. Knowledge of goals and tradeoffs clarifies what density-transfer is expected to accomplish. When a community has a clear master plan formulated and density-transfer appears to be a suitable alternative more detailed analysis can be initiated.

Designing a well functioning density-transfer program involves balancing land preservation goals with the carrying capacity of transfer sites, all the while staying within the constraints imposed by the overall market for development. Possible preservation and transfer sites must be delineated. The preservation areas should be of importance to the entire community, and the transfer sites must have sufficient current carrying capacity to accomodate the transferred development (Nieswand and Pizor). In most instances where undeveloped land exists, this will include making commitments for water, sewer, and highway infrastructure.

In addition to the physical suitability of preservation and transfer sites, there needs to be enough development pressure to bring about the promise of a substantial volume of new construction. What is substantial in one community may be insignificant in another, but, at a minimum, a profile of the regional development pattern should be gathered. Where market pressures are strongest, development rights like other components of the housing market will sell best.

Program goals can often be accomplished by meshing density transfer with other community programs. This will often enhance marketability considerations in establishing density-transfer programs. For example, the location and timing of a capital improvements program can be established in conjunction with the expected development plan for preservation and transfer districts.

Analysis of existing density-transfer programs suggests that it is easier to establish the programs at early stages in the cycle of community growth and development. This is because relative flexibility exists in the selection of transfer districts.

Many communities have been hesitant to adopt complete TDR programs, preferring to adopt a partial program. These moves have been prompted by a sense of caution on the part of local government officials. The first-adopting communities felt they were the initiators of density-transfer programs. Most of these programs have been variations on the transfer-of-development credits theme (Hillsborough). These permit the transfer of credits only among landowners in the community, but restrict purchase of credits by third parties.

The transfer section of the ordinance will function best when integrated into the fabric of planning and zoning regulations for the municipality. Some developers fear that density-transfer programs may be abused by the communities through delays in the permit-granting process. Careful attention to the procedures for allowing transfers can ease this fear. A review of on-going transfer programs suggests that those that work best have the simplest ordinance structure and provide for expeditious processing of permits.

Finally, a review process may be made a part of the program. This will enable the community to make revisions in the size of the preservation or transfer area based on the rate at which development rights are being utilized. A rapid series of transactions might suggest that more land could be preserved, while the absence of transactions might reflect cyclical slowdowns in the building industry, the selection of less than optimal transfer zones, the installation of cumbersome procedural machinery, or other obstacles.

Conclusion

Density transfer has now had a decade of experience in widely varying parts of the nation. Transfers are relatively common in New York City and have taken place in such varying locales as California, Florida, Pennsylvania, Maryland, and New Jersey. The first programs tended to reinvent the density-transfer process. These experiments have fostered an abundance of scholarly research, and practical experience is now available. This repository of experience may produce a second generation of both simpler and more effective programs.

References

Beale, Calvin (1975). The Revival of Population Growth in Non-Metropolitan America, ERS-605, Economic Development Division, Economic Research Service, U. S. Department of Agriculture.

Berry, David, and Gene Steiker (1977). "An Economic Analysis of Transfer of Development Rights." Natural Resources Journal. 17:55-80.

Bloom, Janet, and Emily Regnier (1977). Transfer of Development Rights. Monticello, Ill.: Council of Planning Librarians.

Burns, Heather (1975). Development Rights Transfer: Introduction and Bibliography. Monticello, Ill.: Council of Planning Librarians.

Chavooshin, B. Budd (1979). "Preservation of Land for Agriculture in an Urban Environment." Paper presented to the Northeast Branch, American Society of Agronomy, 25 June, 1979.

_____, Nieswand, and Norman (1974). Transfer of Development Rights: A New Concept in Land Use Management. New Brunswick: Cooperative Extension Service (Leaflet 503).

Costonis, John J. (1975). "Fair Compensation and the Accommodation Power: Antidotes For the Taking Impasse in Land Use Controversies." Columbia Law Review 75:1021-1028.

_____, (1974). Space Adrift: Saving Urban Landmarks through the Chicago Plan. Urbana: University of Illinois Press.

_____, (1972). "The Chicago Plan: Incentive Zoning and the Protection of Urban Landmarks." Harvard Law Review. 85:574-631.

Ervin, David E. et al. (1977). Land Use Control: Evaluating Economic and Political Effects. Cambridge: Ballinger.

Helb, John V., B. Budd Chavooshian, and George H. Nieswand (1976). Development Rights Bibliography. New Brunswick, N. J.: Cooperative Extension Service (Leaflet 533).

Merriam, Dwight, and Ann Hayes Merriam (1977). A Bibliography on the Transfer of Development Rights. Monticello, Ill.: Council of Planning Librarians.

Nieswand, George H., et al. (1976). Transfer of Development Rights: A Demonstration. New Brunswick, NJ: (Extension Bulletin 419).

Pizor, Peter J. (1978). "A Review of Transfer of Development Rights." Appraisal Journal 46:388-397.

_____, (1978). "New Jersey's TDC Experience" Environmental Comment.

_____, and B. Budd Chavooshian (1979). "Non-Metropolitan Transfer of Development Rights Programs: Program Experience in the Middle Atlantic States." A paper prepared for the Lincoln Institute of Land Policy Seminar on Transfer of Development Rights, 3 May 1979.

_____, George Nieswand, and John Swanson. (1979). A Transfer of Development Right, Sampler. New Brunswick, NJ, New Jersey Agricultural Experiment Station (Circular 612).

Real Estate Research Corporation (1975). "The Costs of Sprawl: Detailed Cost Analysis" in Management and Control of Growth: Issues, Techniques, Problems, Trends. Washington: Urban Land Institute.

Richman, Hershel J., and Lane H. Kendig (1977). "Transfer of Development Rights: A Pragmatic View." The Urban Lawyer. :571-587.

Rose, Jerome (ed.) (1975). Transfer of Development Rights. New Brunswick; NJ, Center for Urban Policy Research.

Schnidman, Frank (1978). "Transferable Development Rights (TDR)" in Hagman, and Misczynsky (eds.) Windfalls for Wipeouts: Land Value Compensation. Chicago: American Society of Planning Officials.

Small, Leslie E., Victor Kasper, Jr., and Donn A. Derr (1978). TDR: Transfer of Development Rights Marketability. New Brunswick, NJ, New Jersey Agricultural Experiment Station (Bulletin 848).

THE COST OF PROTECTING AND PRESERVING RURAL LANDS

By John L. Knapp#

"There is no free lunch." If market forces are causing land values to exceed current use-value in nonintensive uses of land, then actions to either compensate present owners, divert development to other areas, or modify property rights are costly.

Does the owner of undeveloped land have a right to develop it as he wishes? If "yes," then to avoid development he will have to be compensated in some manner or demand must be diverted from his property. If "no" or "partially no," then zero or less than full compensation is sufficient. Thus, we are not merely referring to mechanical procedures for retaining present land use; we are also considering different philosophical views.

As noted by Gustafson, these philosophical differences are currently under debate and have yet to be resolved.

The conditions under which the regulation of private property rights in land must be compensated is the most widely debated land-use issue in the United States. Those supporting compensation argue that the "taking clause" in the (fifth amendment) of the U.S. Constitution protects the right of the individual to do whatever he wants with his land regardless of its impact on society; any restriction of private rights represents a "taking" (of private property value). Hence, government is compelled to compensate when it regulates all but nuisance-like land uses (e.g., regulating the location of slaughterhouses, airports, etc.).

Supporters of noncompensatory regulation, on the other hand, argue that the risk of noncompensatory regulation being found unconstitutional is more imagined than real--"that the

fear of the taking clause is stronger than the taking clause itself" (Bosselman, et al., 1973). They point to the recent (that is, the late 1960s and early 1970s) tendency of the courts to approve noncompensatory land-use regulations, particularly if the importance of the public purpose served by the regulation is well demonstrated. Hence, they advocate for the position that ". . . a regulation of the use of land, if reasonably related to a valid public purpose, can never constitute a taking" Bosselman, et al., 1973).^{1*}

As an economist, I do not attempt to judge which of these views is appropriate or, in fact, if there is some middle ground. Instead, my task is to evaluate the effectiveness of the major land preservation programs in our institutional setting and to analyze who bears their cost.

The major land preservation programs available are zoning, use-value taxation, fee simple purchase, purchased development rights, transferable development rights, and utility location. Each of these will now be examined.

Zoning

Zoning can be used to prohibit land from being developed intensively. If the land has been zoned for non-intensive uses and if the land market accepts zoning as a given, then market values for the zoned land will be lower than they would be in the absence of the land-use restrictions. However, if there is a strong likelihood that zoning can be successfully appealed, then market values of land may be only slightly affected. In other words, if zoning does what it claims to do, the major cost--the forgone revenue from developing land in accordance with market demand--falls on landowners at the time

*See notes, page 62.

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zoning is implemented. However, if zoning can be effectively circumvented by the arbitrary granting of variances, then zoning will not impose significant costs on owners of undeveloped land except for costs of litigation. Costs to the public sector for zoning are the costs of implementing and defending the zoning ordinance. These costs will vary directly with the stakes involved. If the land is not under development pressure and little forgone opportunity is involved, then the zoning procedure may be simple and litigation unlikely. The opposite will occur if the stakes are high.

In general, zoning as normally applied to agricultural zones appears to be an ineffective land-use control because there is no certainty that the courts will uphold it. "Drawing the line between valid regulation of land use by zoning and invalid regulation constituting a taking of property becomes a particularly knotty problem in areas in which development pressure is great and market values for land correspondingly high."² Another reason why agricultural zoning is generally ineffective is that it is a residual category. "Typically, it has been the practice to zone residual lands to agricultural uses--after all commercial, residential, industrial and other uses have been accommodated, the remaining land is zoned agricultural. Under these circumstances zoning changes from agricultural to more intensive uses are easily obtained."³ Moreover, if valuable administrative time goes into formulating a zoning ordinance that may be overturned". . . these costs and uncertainties militate against agricultural zoning as a method of achieving planning control in the public interest."⁴

Use-value Taxation

Use-value taxation is frequently promoted as a land-use control mechanism. Under use-value taxation, agricultural land is valued at its agricultural use-value rather than its market value. Of course, if the market considered that agricultural use was the highest and best use of a parcel, then agricultural use-value and market value would be the same.

Generally, land qualifies for use-value taxation as long as it is kept in a conforming use. If the land is converted to commercial or residential use, there is a penalty in the form of a tax rollback. Usually the rollback is limited to a short span of years and interest, if payable, is not compounded.

If it is assumed that a local government first establishes its revenue requirement and then sets its real estate tax rate to raise the required amount, then the cost of use-value taxation for eligible land is only partially borne by owners of noneligible property. How much is borne by owners of noneligible property depends on their share of market assessed value. If their share is small, then it is not possible to shift much of the burden to such owners because in order to raise the required amount of revenue, it is necessary to make a large increase in the tax rate. In contrast, if the share of market assessed value represented by noneligible properties is large, then much of the tax burden can be shifted to them.

If a use-value taxation program is financed by the state government, then the cost is borne statewide according to the incidence of the tax instrument used. For example, the states of Michigan and Wisconsin allow eligible landowners to take a tax credit for local property taxes against their state income tax.^{7, 8}

Any tax savings from use-value taxation is a benefit only to the original participating landowners. Assuming that the tax saving is capitalized into higher market value, a subsequent owner of an eligible property must pay a higher purchase price representing the capitalized value of discounted future tax savings. If the additional cost of the land were financed by borrowing, one could argue that what the new owner gained from lower tax payments would be offset by higher mortgage payments. In an inflationary environment when the price of land is rising rapidly, tax capitalization effects may be obscured. If tax rates are decreased, properties will appreciate in value at a faster pace than would have occurred without a change in tax rates.⁹

Use-value taxation provides tax relief for the original owners of eligible property. This may be new tax relief, or if use-value taxation merely replaces previous extra-legal preferential assessment, then use-value taxation merely continues tax relief in a new form.

Tax relief provided by use-value taxation does not serve as a land-use control device. The major reason is that when land comes under development pressure the opportunity cost of keeping it in nonintensive uses far exceeds any tax saving from use-value taxation. This is easily illustrated.

A recent U. S. Department of Agriculture study of price per acre of farmland by probable use five years after purchase found

that land in the Appalachian region, which includes Virginia, sold for an average of \$1,131 per acre if the purchaser felt it would be used for agriculture only, but it sold for an average of \$1,552 if the purchaser felt it would be used for a residential subdivision.¹⁰ Assuming the \$421 difference between the two values is a rough indicator of the opportunity cost of keeping land under development pressure in agriculture, we can show the annual tax savings versus the opportunity cost for a 200 acre farm.¹¹ Assume the true tax rate is \$0.75 per \$100 of assessed value. This is a fairly high tax rate; most Virginia farm counties have much lower rates.¹² The high rate is used because tax rates tend to be higher in urbanizing counties.

	<u>Market</u> <u>value</u>	<u>Use</u> <u>value</u>	<u>Differ-</u> <u>ence</u>
Assessed value	\$310,400	\$226,200	\$84,200
Tax	2,328	1,697	631

The tax saving under use-value taxation would be \$631. However, if the land had been sold and the proceeds invested in a comparable farm not under development pressure the land owner would have an additional \$84,200 to invest. Assuming an after-tax interest return of 8 percent, the difference in principal would annually yield interest income of \$6,736. Subtracting from interest income the tax saving of \$631 the net annual opportunity cost of not developing the land would be \$6,105. From this example, it is obvious that tax savings from use-value assessment are not a major deterrent¹³ to converting land to intensive uses.

In view of the preceding analysis, it is not surprising that empirical studies have found use-value taxation to be an ineffective land-use policy. Authors of several studies have concluded that use-value taxation has ". . . relatively little impact on the rate, timing or spatial distribution of the conversion of agricultural and other open-space lands to other uses. . . ."¹⁴

Fee-simple Purchase and Purchased Development Rights

Outright purchase of land or purchase of those development rights that government wishes to eliminate is a straightforward procedure for affecting land use. This method of land-use control gives high visibility to the costs of avoiding a market solution to land use.

The cost of such a program is dependent on how many acres are acquired and the difference between the acquisition price and

the value in a less intensive use. (I assume that if a fee-simple purchase were made, the acquiring government would lease-back land for nonintensive uses.¹⁵)

The design of the purchase program would affect the purchase price. For example, a plan involving large initial purchases would probably be more costly¹⁶ than a right-of-first-refusal policy.

The Suffolk County, New York, plan is the first major example of a purchase-of-development-rights (PDR) program. Suffolk County is located on Long Island which is under strong development pressure, and the cost of acquiring development rights was high. "Although Suffolk County land is valued for its agricultural worth at \$1,000 to \$1,500 per acre, its market value ranged¹⁷ from \$4,000 to more than \$15,000 an acre."

Phase 1 of the program was completed in 1977, and during this phase the county acquired development rights to over 3,200 acres at a cost of about \$12 million.¹⁸ The cost ranged from \$2,900 to \$3,200 per acre.¹⁹ Phase 2 involving about 6,600 acres costing about \$35 million should be completed by mid-1980. Phase 3 will be a filling-in process and is expected to cost \$10 million, bringing to \$57 million the cost of the entire program. The purchase of development rights was initially financed²⁰ by the sale of 30-year municipal bonds. Because the real property tax is the primary source of revenue for the County, debt service for the bonds will require higher real property taxes. The cost will be borne by property owners in proportion to the assessed values of their real property. Those properties for which the development rights have been sold will be assessed at their agricultural value. Thus, most of the increased tax burden will be borne by nonagricultural property and agricultural property retaining development rights. This is a static analysis. If one considers growth, then eliminating some land from future residential use will slow future development and the growth of the tax base. Coincidentally, there will be a slower growth in expenditures if²¹ the population to be served is smaller.

In addition to the Suffolk County plan, locally-based PDR programs have been enacted in some towns in Massachusetts. State-based programs have been enacted in Connecticut, Maryland, and New Hampshire. County-based programs have been enacted in King County,²² Washington, and Howard County, Maryland. New Jersey seriously considered a demonstration project in Burlington County but failed to purchase any easements prior to²³ expiration of the legislation in July 1978. The Maryland program, which was only recently

funded, provides for state-local funding of development rights purchases. The state's share (roughly 83 percent²⁴), estimated to be about \$7.5 million annually,²⁵ is derived from a state rollback tax levied on agricultural land converted from being taxed at use-value to being taxed at market value,²⁶ a state real estate transfer tax, and general tax sources. At the local level various sources of funding may be used. Howard County earmarks for this program one-fourth of a 1 percent tax on real estate transfers, the two other counties use general tax sources.²⁷ The program is of interest because a major portion of the cost is provided by state government and some of the principal sources of revenue are not general tax sources but, instead, are related to development. Assuming these taxes are borne mainly by land-owners of developed and transferred properties, the costs of preservation, which may be considered a public good benefiting all society, are shifted to particular groups.

Additional information in the cost of a PDR program is provided by a 1977 survey conducted by Conrad and LeBlanc of twenty-two agricultural landowners in the town of Hadley, Massachusetts. Survey participants were asked to estimate the price they would demand for their development rights under a hypothetical PDR program. The researchers found that this price, "the reservation price," had a median value of \$2,500 per acre. The median agricultural value as estimated by respondents was \$725.²⁸ The study also found that respondents would be willing to sell their land outright for a lower price than the sum of the reservation price and agricultural value. Given this outcome, the authors concluded that fee simple purchase with leaseback might be less expensive²⁹ than purchased development rights.

Transferable Development Rights

Transferable development rights (TDRs) have been the subject of many studies but have yet to be adopted on any large scale.³⁰ Under a TDR program, landowners in areas designated for extensive use are provided with transferable development rights as compensation for the loss of the right to develop their own land. A market is created for the TDRs, since without them, land in designated areas cannot be developed. A major distinction of the TDR plans is whether or not the government provides a market for purchase of development rights.

A superficial attraction of TDRs is that they appear to provide compensation to landowners who lose their development rights

without involving public expenditures except for planning and administration. The analysis of who actually bears the cost is difficult because the outcome varies according to the specific features of a TDR program and of the market environment in which it operates. The first consideration is the distribution of development rights. Three bases have been proposed for the distribution: (1) unused density permitted under existing zoning; (2) assessed or market value of the property; and (3) land area. None of these bases employs the market value of development rights (the difference between market value and the permitted-use value).³¹

If the government does not support the market for development rights, then their value is a function of the demand for them in the area where development is permitted.³² If existing zoning were already quite liberal, then developers would have little incentive to purchase the TDRs. If downzoning were used in the developable area to enhance the value of the TDRs, this would raise the same³³ equity issues as current land-use controls.

The alternative to a private market for TDRs would be a public market in which the government guaranteed a certain purchase price. This would reduce uncertainty for landowners with development rights for sale and assure that the rights were legally acceptable as compensation, but it would raise the problem of financing if existing market demand for the PDRs were inadequate to support the required purchases.³⁴ If the locality's general tax base were used to support purchase of TDRs, then the public cost of the TDRs would follow the incidence of the tax instrument(s) used. In contrast, if we assume that there would be a strong demand for the TDRs, the cost would be borne by restricted landowners in the developable area, developers, or final consumers. "The extent to which each group shares in the cost depends on the market power of DR (development rights) holders and development district landowners, the elasticity and strength of demand in the development district, and the bargaining skills and strategies of all parties involved."³⁵

Timing and Placement of Utilities

One way to discourage the conversion of farm land to more intensive uses is to increase the attractiveness of other sites. This can be done by providing sewer, water, and other amenities to those geographic areas where growth is desired.

If large capital investment is required and there are few presently-served households, then the local government faces

the cost of making debt service payments out of current revenues. This assumes that eventually development would provide a revenue base to support debt service, but the interim period could be lengthy. Furthermore, there is no certainty that development will be diverted from the undeveloped area to the favored area, unless a stick, such as zoning, were added to the carrot of investment in infrastructure in the favored area.

Conclusion

This paper has examined the cost and effectiveness of the major land-use preservation programs either in operation or under discussion in the United States. In many cases the analysis of cost burden is complex and dependent upon well-defined assumptions. To summarize the findings, I

use a table format identical to one developed by Berry and Coughlin.³⁶

Although effectiveness and public cost are shown in separate columns, these characteristics should be considered in tandem. A "low-cost program" that has very little impact on land use is actually a very high-cost program in terms of an output measure such as cost per acre saved.

In this paper, I have confined my analysis to primary effects. However, because of the complexity of land markets, any land-use policy will have secondary effects. For example, a successful land preservation program would be expected to reduce the supply of land for other development purposes and to raise costs for homeowners and businesses forced to compete for a reduced supply of land.

Table 1.--Characteristics of methods for preserving rural land

Method	Effectiveness	Public cost	Degree of uncompensated regulation
1. Zoning	Low	Low	High (if zoning changes are not obtained)
2. Use-value taxation	Low	Low to	Low or zero
3. Fee simple purchase with lease-back or purchase of development rights	High	High	Low or zero
4. Transferable development rights with a private TDR market	High	Low	Unknown
5. Transferable development rights with a public TDR market	High	Unknown	Unknown
6. Timing and placement of utilities	Unknown	Medium to high	Zero

Notes

1. Greg C. Gustafson, "Land-Use Policy and Farmland Retention, The United States Experience", in Agriculture in the Planning and Management of Peri-Urban Areas, Vol. II (Paris: Organization for Economic Cooperation and Development, 1979), pp. 716-717.
2. David F. Newton and Molly Boast, "Preservation by Contract: Public Purchase of Development Rights in Farmland", Columbia Journal of Environmental Law, Vol. 4, No. 2 (Spring 1978), p. 198.
3. Gustafson, "Land-Use Policy and Farmland Retention," p. 704.
4. Newton and Boast, "Preservation by Contract", p. 199.
5. For a description of the major types of use-value assessment, and agricultural districts, which are another variant, see Gustafson, "Land-Use Policy and Farmland Retention," pp. 705-714.
6. This is illustrated in the case of Nelson County, Virginia, in 1977. The tax levy required to raise \$991,617 without use-value taxation was \$0.52 per \$100 of market value and with use-value taxation the required rate was \$0.57. The aggregate fair market value of property of eligible owners was \$42,380,537 and the use-value of the same property was \$26,999,102, a decrease of 36.3 percent. However, with the application of a higher tax rate, the tax reduction was 30.2 percent. Furthermore, after deduction of application fees totaling \$15,944, the tax reduction to owners was 22.9 percent. See John L. Knapp and Robert W. Watkins, Use-Value Assessment in Nelson County (Charlottesville: Tayloe Murphy Institute, 1978), pp. 20, 22.
7. Philip D. Gardner and Raleigh Barlowe, "Putting Michigan's Farm Real Property Tax in Perspective", Michigan Farm Economics, No. 430 (November 1978), p. 4.
8. Richard Barrows, "Wisconsin's Farmland Preservation Program", University of Wisconsin Cooperative Extension Programs, No. G2890 (May 1978).
9. E. C. Pasour, Jr., "The Capitalization of Real Property Taxes Levied on Farm Real Estate", American Journal of Agricultural Economics, Vol. 57, No. 4 (November 1975), p. 545 (Pasour illustrates the case of an increase in the tax rate, but his model is reversible).
10. The survey covered farm real estate transfers for the year ending the 1st of March 1979. See U. S. Department of Agriculture, Economics, Statistics, and Cooperative Service, Farm Real Estate Market Developments, CD-84 (August 1979), pp. 13, 61-63.
11. In 1974 the average size of farm in Virginia was 184 acres. Source: U.S. Bureau of the Census, 1974 Census of Agriculture, Virginia, Vol. 1, Part 45 (Washington, D.C.: U.S. Government Printing Office, 1977), p. 1-1.
12. In 1977 the median average effective tax rate on agricultural/undeveloped real estate for parcels over 99 acres in 60 Virginia counties for which data were available was \$0.34 per \$100. Source: Computed from Virginia Department of Taxation, 1977 Virginia Assessment/Sales Ratio Study (Richmond: Virginia Department of Taxation, 1979), p. 26-29, 32-34.
13. For a more detailed analysis of tax savings versus forgone interest, see Robert E. Coughlin, David Berry, and Thomas R. Plaut, "Differential Assessment of Real Property as an Incentive to Open Space Preservation and Farmland Retention", National Tax Journal, XXXI, No. 2 (June 1978), p. 175.
14. Gustafson, "Land-Use Policy and Farmland Retention", p. 711.
15. Some Massachusetts towns have small scale purchase and lease-back programs. See: Kathleen Wallace, "Purchase and Leaseback of Agricultural Land by Massachusetts Towns", PFEVL Working Paper, No. 7, n.d. (Obtainable from the Regional Science Research Institute.)
16. However, if property values increased substantially before land went on the market, the cost of a right-of-first-refusal policy might be higher. See Robert E. Coughlin and Thomas Plaut, "The Use of Less-than-fee Acquisition for the Preservation of Open Space", Regional Science Research Institute Discussion Paper Series: No. 101 (December 1977), p. 5.
17. David F. Newton and Molly Boast, "Preservation by Contract", op. cit., p. 194.

18. David F. Newton, "Saving Prime Farmland: The Suffolk County Experience", unpublished manuscript dated October 1979, p. 3.
19. Thomas R. Plaut, "Preserving Rural Uses of the Land: Why? Where? How much? Who pays?" BP-79-6 Bureau of Business Research, University of Texas at Austin, p. 12.
20. Newton, "Saving Prime Farmland", op. cit., p. 3.
21. "While the sale of bonds purportedly will provide the County with sufficient purchasing power to meet its debt schedule, the withdrawal of farmland acreage from 'highest and best use' tax assessment could deplete the revenue base with which bonds are secured. But County officials conclude that demands on public services and facilities made by houses valued at less than \$50,000 exceeds the contribution of those homes to County revenues. Thus, according to County planners, the conversion of farmland to low or moderate cost housing will create a greater drain on County resources than reduced tax assessment of farmland; only residential developments with homes worth more than \$50,000 offer a financially attractive alternative." Newton and Boast, "Preservation by Contract", op. cit., p. 206. This view is not shared by Leshner and Elier who observe, "(t)he program will result in cost savings in public services, but on a per acre basis the development rights will cost more than the present value of the most optimistic estimates of public service cost savings," William G. Leshner and Doyle A. Eiler, "An Assessment of Suffolk County's Farmland and Preservation Program", American Journal of Agricultural Economics, Vol. 60, No. 1 (February 1978), p. 143.
22. Phone conversation with Dennis A. White, Agricultural Land Preservation Administrator, Howard County, Maryland, 4th of December 1979.
23. Phillip Alampi, "Farmland Preservation in New Jersey". (Unpublished paper by the New Jersey Secretary of Agriculture, 14 January 1979.)
24. University of Maryland Cooperative Extension Service, "Maryland Agricultural Land Preservation Foundation: A Summary", Leaflet 88 (1977), pp. 5-6.
25. Phone conversation with Dennis A. White, 4th of December 1979.
26. Maryland Senate Bill No. 942, effective 1st of July 1979.
27. Phone conversation with Dennis A. White, 4th of December 1979.
28. Jon M. Conrad and David LeBlanc, "The Supply of Development Rights: Results from a Survey in Hadley, Massachusetts", Land Economics, Vol. 55, No. 2 (May 1979), p. 270 and letter from Conrad dated 5th of October 1979.
29. Initial expense may not be the only criterion for choice among these alternatives. For a good discussion of problems with a government landlord-private-tenant relationship, see Craig A. Peterson and Claire McCarthy, "Farmland Preservation by Purchase of Development Rights: The Long Island Experiment", DePaul Law Review, Vol. 26 (1977), pp. 456-457.
30. For a description of the TDR programs in Collier County, Florida and in New York City see Franklin J. James and Dennis E. Gale, Zoning for Sale: A Critical Analysis of Transferable Development Rights Programs (Washington, D.C.: The Urban Institute, 1977), pp. 7-11.
31. Ibid., pp. 25-27.
32. John J. Costonis, "Development Rights Transfer: An Exploratory Essay", Yale Law Journal, Vol. 83, No. 1 (November 1973), p. 111.
33. James and Gale, Zoning for Sale, op. cit., p. 23.
34. Ibid., p. 24.
35. Richard L. Barrows and Bruce A. Prenguber, "Transfer of Development Rights: An Analysis of a New Land Use Policy Tool", American Journal of Agricultural Economics, Vol. 57, No. 4 (November 1975), p. 551.
36. David Berry and Robert E. Coughlin, "Land and Landscape in the Philadelphia Region: 2025" Regional Science Research Institute Discussion Paper Series: No. 95 (February 1977), p. 58.

THE USE OF PURCHASE OF DEVELOPMENT RIGHTS TO PRESERVE FARMLAND
--SOME CONSIDERATIONS--

By Dennis A. White#

Real or imagined, the problems associated with farmland loss to urban and suburban growth in the U. S. are under scrutiny by a panoply of private research groups, local government bodies, and federal agencies, all seeking to aid policy and decisionmakers in achieving an ameliorative balance among growth, conservation, and preservation. The difficulty in achieving this balance is hampered by the traditional inability of governments to develop comprehensive growth management plans which acknowledge the fact that a saturation point exists to an area's systems (either environmental or community) beyond which assimilative capacity deteriorates with a resultant decay in system quality. Quite simply, the purpose of land-use planning (in theory anyway) is not to react to private, individual pursuits of financial maximization but rather to develop a scheme of growth that will provide for, encourage, and accommodate a variety of land uses, only one of which is farming.

The latest fervor toward agricultural land preservation results from three basic perceptions held of farmland:

- Its loss means a loss in community identity and a rural way of life.
- Its loss, in the absence of a growth management plan for the area of concern, results in an increase in the costs of sprawl.
- Its loss is one of a resource that cannot be readily retrieved.

The motives behind farmland preservation efforts are not at issue in this paper, but they are the raison d'etre behind the effectiveness of any farmland preservation effort. Nothing will end a program or lose a court case more quickly than ulterior motives. With this caveat in mind, let us

examine the issues involved in the use of a few specific farmland preservation mechanisms.

Land Banking versus Easement Purchase,
Or Owning All Instead of Part

Public land banking is a system whereby a government entity acquires land available for future development for the purpose of controlling the pace and direction of urban growth. By acquiring land in the path of urban expansion, and hence immunizing it from premature development, the land-bank entity can observe market forces and then develop or dispose of the land at a propitious time for development and with use restrictions consonant with a publicly-adopted plan for the area.²

This definition presumes a level of growth capable of being guided and directed via the rules applied to publicly-owned, key parcels of land. Land banking is designed to promote more rational patterns of development, to reduce the cost of land through a more perfect land market, and to eliminate land speculation. By holding parcels in an undeveloped but improved state, a land bank can discourage speculation by the very threat of releasing this prime development land at or below current market prices.

In addition to guiding growth, land banking could conceptually be used to guarantee continuity of farming by outright ownership of the land with a long-term lease arrangement designed to ensure its productivity. In areas of the U. S. where the easement value of farmland exceeds a reasonable percentage of the cost of fee simple ownership, it may be financially prudent for local or state governments to buy

*See Notes, page 68.

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land in fee, rather than pay a disproportionate easement cost; the purchasing government could then exercise one of its options to ensure the continuation of agricultural production.

There are caveats that must be borne in mind when land banking is being considered for the preservation of farmland. First, the cost of owning farmland in fee simple by a government could very well prove to be of such a magnitude that purchasing the acreage needed to sustain an economically significant agricultural base may not be feasible. Second, the purchase and leaseback of farmland assumes that farmers would be willing to enter into lease agreements with government; possibly a valid assumption but with the pride of ownership comes the responsibility for husbandry of the land, which may be lost in a lease operation. In the absence of ownership, would the government be responsible for ensuring sound agricultural land-use management practices? Would the lessee be willing to relinquish his discretion as to what was the best way to use and manage the land? Finally, in these times of scrutiny of governmental spending, would taxpayers remain silent to the idea of government ownership of farmland, especially farmland that historically has been and currently is productive? Government-owned land is land not on the tax rolls not a major capital consideration in light of the cost of acquisition but an added cost associated with governmental ownership.

Consider whether or not governmental units can justify the use of fee simple ownership of farmland as a preservation tool. The tenacity of the concept may very well be reflected in the paucity of its use: the writer knows of no governmental unit which uses the fee simple purchase of farmland as a preservation mechanism.

This raises another possibility: is preservation possible without owning any interest in the land?

Would Not Zoning be Cheaper?

Certainly, zoning would be a cheaper mechanism for farm preservation than easement purchase, because no direct capital outlay is necessary. However, zoning has associated with it one inherent weakness in its use for permanent farmland preservation: it is subject to the political vagaries of the local governmental bodies using it. There is every reason to think that history will repeat itself in the dilution of protection offered within an exclusively-zoned area as caused by pressure for urban and suburban expansion. A classic example is the

expansion of a local water and sewer boundary into an area designated agricultural, followed by pressure to upzone the farmland to residential uses due to the availability of central water and sewer.

On the assumption that (somewhere) there may be a unanimity of support for zoning controls to protect and preserve agricultural land, two basic options are available.

--Exclusive agricultural zones which would permit, exclusively over all others, all agricultural, horticultural, or silvicultural land uses and commercial and quasi-industrial type agricultural uses necessary to serve the farming community. Single family residential development would not be permitted unless directly related to farming activities; that is, subdivision would be permitted for only a son, daughter, or tenant farmer. No minimum lot size would be designated, just parcel size.

--Preferential agricultural zones which would allow the creation of a limited number of lots from the original farm for one time only. A minimum lot size would be specified.

While justification for the use of the police power in the form of zoning grows with each research study which documents the environmental and esthetic atrocities associated with farmland conversion, explicit prime land identification and unanimity of support from affected landowners is extremely difficult to coalesce into acceptable zoning controls at the local government level.

Discussions involving farmland preservation at the program implementation level tend to gravitate toward the issue of "just compensation." This is a euphemism for maximum return on farmland when it is converted to nonfarm uses by the owner who no longer wants to crop the land. The precedents of court rulings on the compensation issue reflect the point that the restriction of land to a use of which it is reasonably suited is sound and does not require anything remotely associated with compensation on the part of local governments. This point of law, though, often has little bearing on the political and practical realities of local program implementation. The issue more often becomes: can we save the farmland while still providing a mode of compensation? The answer is yes, which brings the topic to purchase of development rights (PDR), a tool which may operate with or without zoning controls. Before delving into the effectiveness of each alternative, a brief overview of PDR is in order.

PDR in General

The right to develop land, at whatever level and in whatever fashion, is one of a host of rights associated with land ownership. A Purchase of Development Rights program seeks to preserve farmland by compensating landowners for relinquishing this right. Landowners selling an easement are being paid as much not to subdivide their land as a developer would pay them to subdivide. No bank of development rights is created by the purchasing body; rather, payment is made to landowners for accepting an easement restriction upon the deed to the land. Whether called an open space easement or a conservation or development right, the entity is legally considered a negative easement (usually in gross) which limits or restricts the fee owner's use of the property without entitling the grantee, that is, the purchasing body buying the easement, any use of the land; hence, the concept of relinquishment.

The mechanism for legally incorporating a restriction on the use of land is accomplished through the use of covenants, which, when of a restrictive nature, are generally viewed as creating easements. As long as the language clearly authorizes the creation of a servitude or restrictive covenant, the technical form of the agreement is not material. In addition, since the sale is voluntary--thus obviating the use of the power of eminent domain--neither the State of Virginia nor local government units at large need be thwarted by the extant fear associated with the Dillon Rule. The authority to buy, lease, or accept as a donation easements for whatever purpose is established in state enabling legislation. For example, Howard County's Annotated Code (reflecting state enabling legislation) covers easement acquisition with a succinct paragraph which states: ". . . to provide for the acquisition by the purchase, lease, or otherwise . . . for public purposes in the county." The salient issue facing Virginians should not involve the legality of easement acquisition for the preservation of farmland but rather how to husband the technique for maximum effectiveness in light of limited financial resources.

PDR on its Own: Voluntary Preservation

Upon the implementation of a PDR program without zoning controls, farmland owners have three options: first, continue farming and do not bother to participate in the government's latest new-fangled scheme. Second, sell development rights to the farm to help pay the bills or buy more land and equipment, assuming the offer made is

accepted. Third, sell out to the nice young man who dropped by the other day with an attractive offer from the Happy Knolls Subdivision Corporation. In areas where there is little or no development pressure on the farmland, the third option may not be available, in which case a voluntary PDR program will function quite well, but if there is no subdivision pressure, there is little incentive to implement farmland preservation efforts. The reader would undoubtedly have to spend considerable time attempting to recollect occasions when government action was not done in reaction to a problem or condition rather than in advance of it. So the problem of subdivision pressure exists, and the third option is available: what happens then? What happens is that a PDR program enters a race with development to see which gets the land first. The PDR will win, in a manner of speaking, only if there are enormous sums of money available for acquisition and the farmland owners' dedication to farmland is strong enough to entice them in sufficient numbers to go through the two-step process of receiving a third to a half the value of their land from easement sale and the balance from a buyer interested only in farming. The realities are more in this line: there is a minimal amount of money available in any one year and the bulk of farmland owners are not interested in waiting for available funding in future years when cash-on-the-barrelhead offers are being made by the developers. Consequently, easement acquisition are made in a random fashion, thus obviating the creation of large farmland blocks which would be immunized from incompatible residential encroachment. The relatively few farms preserved by PDR would be insufficient to sustain a sound agricultural economic base, leaving the locality with open space but no farm industry to speak of. The PDR program would have been a dismal failure.

PDR and Zoning: A Complementary Coalescence

Given limited annual funding and only modest initial acceptance by farmland owners, a PDR program must be given an opportunity to gain acceptance and financial backing. This opportunity is best manifested in operating time during which subdivisions may not be in competition with farmland preservation. Such a state is most effectively achieved by implementing zoning controls which preclude the ability to convert farmland. This action will raise two classic questions: first, why bother with compensation at all if zoning can be justified? Second, how can there be a fair market value for easement determination if exclusive agricultural zoning prevails? The issue of compensation must be decided long before any type of farmland preservation mechanism is chosen. When deciding to zone

simultaneously with PDR, a locality would already have decided upon which course of action was best. In the case of implementing PDR, a compensation option was already deemed as being appropriate; the zoning issue was ancillary to the one of compensation, but existing conditions required the implementation of a disincentive to development. By far, the most effective disincentive is prohibition.

Land which is zoned for agricultural use may still be appraised for fair market value. Under the Maryland PDR program, for example, appraisal guidelines instruct agents to value the farm at a prezoned level, and since most agricultural zoning was implemented fairly recently, it is not too difficult to find historical figures which can be updated to current dollar values. Even as a last resort, the county government could establish an average fair market value for appraisal use only. While somewhat artificial, the value could be established so as to be reasonably equitable. Another creative option would tie agricultural and fair market values to soil classes, with each soil category having a double value for appraisal purposes.

Whatever valuation method is chosen, the possibility exists for establishment of some fair market value on agriculturally zoned property. A landowner may not be guaranteed of receiving the maximum value obtainable from a developer or speculator, but an honest attempt at equitable treatment is the best that can be hoped for anyway. An effective method of ending a discussion on the profit maximization issue may be to offer the landowner the option of zoning with no PDR as an alternative.

A final defense of combining zoning and PDR may be found in the weakness of using zoning as an exclusive preservation tool. Granted, it is clean, simple and cheap, but it is only as permanent as the wishes of a board of supervisors currently holding office. Rezoning and subsequent farmland loss is never more than a few votes away unless an additional control mechanism can be added. The PDR can do this by taking preservation out of the realm of politics and into the realm of law. If an easement is purchased on a property, it is a covenant on the deed which prevents development, not the zoning currently in existence. By buying easements, governments are actually saving themselves from future pressures to rezone will have no bearing on the developability of property on which easements have been secured.

To summarize, then, zoning will buy the time needed to implement PDR, and PDR will

reinforce the intent of zoning by adding permanency to preservation efforts; the circle is complete. Upon zoning, the government has removed the third land use option of selling out to developers and given itself time to (a) educate landowners about the concept of PDR (b) maximize the use of limited funds (c) establish acquisition priorities so as to create contiguous farmland blocks.

A final note: the success of farmland preservation efforts rests in large part upon eliminating the pernicious philosophy that those who own and use land devoted to farming have the right (albeit tacitly) to the final decision as to whether or not the land will continue to be farmed by future generations or whether its next crop will be subdivisions. Before deciding which mechanism to use to preserve farmland, policy- and decision-makers would be wise to first reach a decision regarding this fundamental tenet of resource ownership. Finally, our present land-use dilemmas are painful testimony to the fact that one cannot please all of the people all of the time.

Notes

1. The National Agricultural Lands Study, jointly sponsored by the USDA and the CEO is the most comprehensive research effort to date.
2. Fishman, R. P., "Public Land Banking: Examination of a Management Technique" in Management and Control of Growth, Series Volume III, the Urban Land Institute, Washington, D.C., 1975.
3. Howard County Code Subtitle 2. Real Property, Sec. 7.200. Acquisition of real property. The county executive is authorized to acquire, by purchase, gift or lease for public purposes . . . the fee simple or leasehold or such other interest as the county executive may deem to be necessary or desirable in any real property located within the county, including any or all property rights, interest, easements or franchises in the same.
4. Except in a few local governmental offices where salary supplementation is proffered.
5. These options are not mutually exclusive and may be used in concert for stronger "ag" area protection by allowing the preferential zone to act as a buffer between the exclusive agricultural zone and the rural residential (suburban) areas.

ISSUES ASSOCIATED WITH CHANGING RIPARIAN WATER LAW

By Sandra S. Batie, William E. Cox,
J. W. Looney, and Richard A. March#

Many states have or are currently considering modifying their water laws. This is particularly true of those states which initially gave acceptance to the riparian doctrine as the basic mechanism for allocation of water from streams. Virginia is such a state.

The riparian doctrine establishes rights to use the water in watercourses based on ownership of land traversed or bordered by a stream or river. This doctrine, which functions well when there is an abundance of water, has been rejected or modified by some states in an attempt to better manage water resources after scarcities have been perceived. Trelease has made these comments.

Riparian law seems to be based upon an unspoken premise that if rights to use are restricted to those persons who have access to the water through ownership of the banks, and if those persons restrict their demands on the water to reasonable uses, there is enough for all. In such a situation there is little need of precise laws and institutions for water allocation, other than a mechanism for settling the few disputes that do arise. But today we have come to realize that there is not enough water to permit the free exercise of all man's wants (Trelease, p. 7).

In Virginia, the law applicable to streams has undergone considerable expansion in recent years. These additions create or extend state water management activities in a variety of areas, including policy, planning, and regulation. These statutory enactments impose additional constraints on water use but do not modify the traditional common law system of allocation; the basic institutional mechanism for streamflow allocation continues to be the riparian doctrine. (See Code of Virginia Ann. secs. 62.1-10 et seq.)

62.1-44.36 (1973), sec. 62.1-44.38 (1973), secs. 62.1-104.1 (Supp. 1979), 10-167 et seq. (1973), as amended (Supp. 1979)).

Historically, water supply has not been an important problem in Virginia. In 1975, total water withdrawals in the state, for all purposes except hydroelectric power generation, averaged 4.9 billion gallons per day (gpd), of which slightly over 95 percent consisted of surface water withdrawals. This usage may be placed in perspective by noting that average streamflow in the James River at Richmond is about 4.8 billion gpd. Consequently, Virginia's total water availability would not appear to be a significant concern in the foreseeable future.

However, comparing average water use across the state with average flow of one or more streams fails to show the existence or extent of water supply problems. Average streamflow encompasses time periods of both flood and drought, making it an unreliable measure of readily available supply. Also, a considerable disparity exists among geographic patterns of water supply and population distribution. In Virginia, the existence and extent of water supply problems created by the natural variation in water distribution as to place and time have combined to produce significant local and regional water shortages within a general area of water abundance. Impending regional water supply shortages in Virginia have resulted in plans for major water supply development projects that, in turn, have given rise to questions concerning the adequacy of the existing institutional structure for allocating water among competing interests. One of the basic consequences of this concern has been the creation of a legislative study commission to

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consider modifications in Virginia's water law (Virginia General Assembly). Thus, Virginia is at a significant period in the evolution of water management institutions.

This paper will identify and analyze the issues involved in determining the desirability of changing Virginia's water law, but it will not endorse any particular course of action for the state to pursue. Specifically, the paper will

- identify basic objectives of a water allocation system,
- evaluate the current system in terms of these objectives, and
- assess the potential problems associated with changing the existing allocation system if that course of action is deemed desirable by the State Water Study Commission and the legislature.

Objectives of a Water-allocation System

In order to evaluate the performance of any water-allocation institution, it is necessary to identify a set of objectives the institution should achieve. This is because at any one time only a single system of water-allocation is in effect in any one state; therefore, direct comparison of the actual performance of alternative institutions is difficult. While it is possible to compare the performance of water-allocation systems among states, isolating the effects of the allocation system from the numerous other factors affecting water resources development is also difficult. Even in states that have recently modified their water-allocation systems, there is no direct method of comparing what actually occurred in the state under the revised system with what would happen had the old system been retained.

Objectives can be identified as standards for evaluating the performance of Virginia's water-allocation system and as a basis for proposals to modify the system to improve performance in those areas where weaknesses are identified in the existing system. The objectives which appear to be the most appropriate include these:

- The water-allocation system should facilitate application of water to its highest and best use.
- Interests of the public should be given adequate consideration in determining what is the highest and best use.
- There should be adequate integration of water-use decisions with other resource management decisions.
- There should exist efficient

mechanisms for conflict resolution concerning competing water uses.

The present Virginia riparian doctrine can be critiqued with respect to each of these objectives. These objectives represent some of the goals a governmental body may attempt to achieve through its water rights system, but other objectives may be relevant depending upon local conditions. The relative weight attached to each of these objectives is a decision that will eventually be decided in the political arena.

Water Should be Allocated to its Highest and Best Use--The objective of allocating water to its highest and best use involves attempting to insure that at any given time water is being allocated to uses deemed most beneficial by society. Two characteristics of water rights are important in facilitating the allocation of water to its highest and best use: flexibility and certainty. The riparian doctrine has been criticized for lacking both of these characteristics.

Flexibility of rights. A primary aspect of flexibility concerns transferability of water among uses and geographic locations. Flexibility among uses requires that water be freely transferable from one use to another in response to changing conditions. This requires that there be no artificial barriers regarding purposes for which water can be used. Flexibility among geographic locations requires that the place of use of water not be artificially restricted. Change in place of use may involve transfers among users within a watershed, including transfers among riparians and non-riparians, and transfers between watersheds.

Any institutional barriers to these transfers will make it more difficult to insure that water is put to its "highest and best use". Levi states the point well.

It is submitted that making a water right freely transferable separate and apart from the land is a very important prerequisite to establishing a water-law system which encourages the most beneficial water utilization. It would permit attainment of the highest and best use because those who can utilize the water more profitably will be willing to pay more for the water right. It would permit usage to shift freely from the agricultural to the industrial, municipal, or other sector of the economy (Levi, p. 174).

A basic aspect of the riparian doctrine is its requirement that water be used on riparian land. This establishes limits for the transport of water. The basic

requirement for land to be considered riparian is physical contact with the stream in question. The maximum extent of riparian land generally is considered to consist of the boundary of a stream's watershed (Town of Gordonsville). This restriction is a direct impediment to transbasin diversions, even in times of shortage or where such transfers would encourage a desirable development of water resources.

The restriction that water acquired under riparian rights can only be used on riparian lands may act to prevent attainment of the highest and best use of water. In practice, Virginia courts have adopted the rule that water may be used on non-riparian land in the absence of injury to other riparians. The Virginia Supreme Court in 1925 quoted, with approval, from an earlier Massachusetts decision.

If he diverts water to a point outside the watershed or upon a disconnected estate, the only question is whether there is actual injury to the lower estate for any present or future reasonable use. The diversion alone, without evidence of such damage, does not warrant a recovery of nominal damages (Virginia Hot Springs Co.).

Allowing use of water outside the watershed in cases where no other riparian is harmed increases the flexibility of water rights, but the actual impact may be minor because of the uncertainties involved in determining "whether there is actual injury to the lower estate for any present or future reasonable use" (Howe and Easter, 1971, p. 105, emphasis added). Interbasin transfers of water may involve significant capital costs, and, unless assurances could be provided beforehand, that is, ex ante, that such transfers would not be found illegal, the costs of investment capital would be quite high, if such capital could be raised at all.

In addition to transferability among uses and locations, flexibility also involves a time dimension. Flexibility between time periods requires that adequate provision be made for the storage of excess water during periods of abundance for use during periods of drought. The institutional framework for water management should give proper consideration to recognition and maintenance of water rights regarding storage and to other issues associated with storage operations.

Because the riparian doctrine traces its origins back to a time when water was abundant and the needs for storage were not great, the doctrine makes little provision for storage of water and maintenance of rights in stored water. For example, rights

in stored water may be lost if the water is released into a natural stream for conveyance purposes. However, Virginia riparian owners desiring storage of water above average stream flow for later use may do so with proper permitting providing there is absence of damage to others, ownership of the land involved (except that publicly-owned lands may be utilized), payment of all costs, approval of construction by qualified people, maintenance of certain minimum-flow releases, the limiting of storage of irrigation water to that needed for a twelve-month period, maintenance of all structures, and provision of information to the state (Virginia Code Ann., Sec. 62.1-106, (1979 Supp)).

Certainty of rights. The benefits of transferability and flexibility in water use can only be obtained if water rights are reasonably certain in their legal status. Therefore, a necessary condition for highest and best use is that the water-allocation mechanism should minimize uncertainty (or, conversely, increase the information provided) regarding the right to use water. Riparian rights are by nature uncertain. "The main reason for this is the uncertainty inherent in the notion of 'reasonable use'."

Because of the very nature of the reasonable use concept, it cannot be known with any degree of definiteness who may use the water, how much he can use, or for what purpose he can use it. A use which today furnishes no basis for complaint may give rise to a lawsuit tomorrow; what is reasonable at one moment may prove unreasonable shortly thereafter. A person initiating a particular use is uncertain as to whether his use may interfere with the reasonable use being made by some other person, or whether it may interfere with a reasonable use which may be initiated by someone in the future. Further, the user has no assurance that, after he has invested in an enterprise which depends upon a given source of water, his supply will not be jeopardized by a new and reasonable use made by some upper riparian. Any riparian owner (and perhaps in some instances a non-riparian owner) may at any time initiate a new use of water or increase the use which he is making, and it will be protected if reasonable (Lauer, p. 13).

Thus, the concept of reasonableness, which is the central element in defining the extent of water rights under the riparian doctrine, is such a relative concept that it produces considerable uncertainty. Individuals are uncertain as to the continuing magnitude of the riparian right and how it can be legally used.

The significance of these uncertainties is that they are believed to result in several undesirable economic costs. For example, it is generally believed that uncertainty has the undesirable consequences of discouraging private investments (Farnham). Private investments in irrigation systems, in private water-projects, and in water-using industrial processes all require some security of investment. Generally, the lower the security of investment, the higher must be the expected net returns to the investment if a project is to be undertaken. Individuals would not likely be willing to participate in the construction of a private reservoir if their rights to use the water were not reasonably secure or if they were unable to exclude potential users. Public projects may be hindered by institutional obstacles that potentially require unknown compensation to injured holders of riparian rights. Thus, uncertainties intrinsic in the riparian law serve as impediments to both public and private planning. These uncertainties can also result in water quality problems, in drought-caused losses, and in "mining" of ground water.

Allocation Should Consider the Public Interest--Water-allocation mechanisms should contain procedures to insure that public values will be considered. This explicit consideration of the public interest in water is particularly important when any mechanism is designed to facilitate transfers of water rights. Among the specific public interests which will need to be considered in a system of water rights are

- fish and wildlife preservation,
- swimming and boating,
- aesthetic enjoyment, and
- scientific study.

These public interests exist primarily in the form of instream uses. A recent California study contains this statement:

Interests in instream uses tend to be diffuse, and instream uses tend to be of general public benefit. While instream uses are considered to be beneficial uses of water, their enjoyment cannot, as a rule, be secured by a (private) water right (Governor's Commission, p. 99). Because of the difficulties in protecting instream values and other public interests in water through private rights, any allocation system should take explicit account of these interests. Noting the competition among private consumptive uses of water and public instream uses of water, the study suggests that an allocation system should give equal consideration to both types of use and notes that existing systems, both in

California and elsewhere, do not necessarily achieve this objective. In principle, a well conceived system for allocating water among instream and off-stream beneficial uses would weight the relative values of competing uses, both public and private. The various instream uses should participate equally in the present system for allocating water supplies (Governor's Commission).

The riparian doctrine makes little explicit provision for protection of instream flows. In the face of expanded private demands for water in Virginia, there is a need for definite provision within the allocation system for maintenance of minimum streamflow. Unfortunately, there is considerable uncertainty under the riparian doctrine regarding protection of instream values.

Virginia law provides for the formulation of a water resources policy that is to consider instream needs. The State Water Control Board is required, when developing policy, to take into account, among other things, this principle: "The maintenance of stream flows sufficient to support aquatic life and to minimize pollution shall be fostered and encouraged (Va. Code Ann.)." However, there is no direct institutional mechanism for implementing this policy provision because there is a lack of administrative controls over withdrawals from streams.

Integration with Other Natural Resource Management Goals--Water-allocation mechanisms must recognize and integrate with other resource management goals. The riparian doctrine does not automatically provide for coordinating allocation decisions with broader aspects of water resources management and environmental protection efforts. Because of the judicial nature of the process, allocation decisions under the riparian doctrine are insulated from state water- and land-resource policy and plans, and there is no direct mechanism for coordination between decisionmaking relating to water withdrawal and the water quality management programs. Public water management can also be hampered because of the uncertainties associated with poorly defined rights under the riparian doctrine.

Water laws in Virginia and many other riparian states provide separate legal regimes for the management of surface water and ground water. However, both surface water and groundwater are related by the hydrologic cycle. This practice of separating allocation principles in a way that differs from the phases of the hydrologic cycle originated in the common

law, and it has been perpetuated in legislative enactments and proposals to date. Yet, allocation of water so that the public interest is best served requires conjunctive management of surface water and groundwater. Neither source is likely to be put to its highest and best use in the absence of a coordinated approach.

Water management must be coordinated with land-use management programs. Flood control, water quality protection, and recreational water use are examples of areas where an integrated approach to land and water management is necessary. Water management in coordination with other programs is also hampered by lack of data. Because of the judicial nature in which the riparian doctrine is implemented, there is no mechanism for the recording of and analysis of water supply and demand data for use in decisionmaking or in assisting future court deliberations. In Virginia, it is difficult to determine how much water is available at any given time in any given stream, as well as how many users have water rights to the existing flow.

Efficient Mechanisms for Conflict Resolution Should Exist--An additional concern is that any water allocation mechanism should facilitate decisionmaking that is timely and involves a low economic cost. Some allocation mechanisms may handle uncontested water rights very efficiently but require costly and time-consuming judicial resolution of allocation conflicts. Other mechanisms may produce somewhat higher costs and greater delays in handling routine applications for water rights, yet contain a relatively efficient process for settling conflicts over water rights. The riparian doctrine is in the former class. When there are few water conflicts, the riparian doctrine is an exceptionally low-cost system to administer. However, as demands on water resources and conflicts over allocation increase, the advantages of a system that efficiently resolves conflicts becomes evident, even if increases in the cost and time involved in settling uncontested rights result.

Achieving conflict resolution in an efficient manner is an objective not only for the resolution of private disagreements, but also for resolving public agency disagreements. Competing public agency goals are not infrequent. For example, a fish and wildlife agency may argue for considerably higher instream flow standards than, say, an industrial development agency will be willing to support. The riparian doctrine has no mechanism for achieving this type of conflict resolution.

Actual Significance of Theoretical Deficiencies of the Riparian Doctrine

This analysis of the riparian doctrine with respect to the four objectives leads to this conclusion. Theoretically, at least, the riparian law has certain inherent characteristics that makes it unsuitable under conditions of intensive water use and conflict among competing interests. However, the extent to which the perceived or theoretical costs actually exist in Virginia is not fully known. There is reason to suspect that not all the costs are as severe as sometimes suggested.

While inflexibility of water use can lead to economic inefficiencies, it may well be that the inefficiencies to date have not been substantial. For example, one of the main concerns in Virginia at present is that interbasin water transfers do not appear legally possible, thereby inhibiting economic growth of southeast Virginia (Batie, et al., and Miller). If one assumes southeast Virginia must have additional water, an examination of alternative water supplies in order to ascertain the least-cost method of obtaining the supply leads to a surprising result.

A cost analysis of water supply alternatives by Anderson, et al., suggests that substantial savings (in southeast Virginia) can be achieved by postponing investment in relatively costly facilities. Relatively small increases in groundwater use and/or utilization of currently available supplies through regional cooperation could delay the need for major investments. In this way, savings can be realized, and projected regional water demands can still be met (Anderson). Furthermore, an engineering report suggests such increased pumpage is feasible without detriment to the aquifer (Geraghty and Miller). Thus, the focus on the interbasin water transfer may emanate from such other factors as inability to resolve interjurisdictional disagreements as well as a hope that less local financing would be involved in a large scale diversion. Whether this situation is typical is not known, but if it is, it suggests that inflexibilities associated with the riparian doctrine have yet to impose large costs.

Furthermore, any water-use transfer process can be thought of in terms of three aspects: legal, financial, and physical (Brewer). While most analyses focus on the legal and physical aspects, some of Virginia's problems may stem from the financial aspects. The State Water Study Commission Interim Report concluded:

In summary, water supply and allocation problems with statewide significance appear in most part with notable exceptions to be those associated with financing of treatment, storage, and distribution systems. The availability of raw water appears to be of lesser significance (Virginia State Water Study Commission, p. 5).

Thus, financing, when coupled with jurisdictional disputes, might account for many of Virginia's actual riparian water problems. If this is the case, the need to modify a legal structure is less apparent.

These perceptions of the economic costs associated with the riparian doctrine are not well documented by empirical studies. For example, although uncertainty will, in theory, influence investment decisions, there is little evidence of the extent of the problem. Industries in Virginia depend mainly on self-supplied water from surface sources, so it is reasonable to assume that they are sensitive to the uncertainties inherent in the law; yet the impact of this uncertainty is not clear. Uncertainty would have lesser impact where other sources are utilized. For example, over 82 percent of all water withdrawn in the state in 1975 for rural domestic use, including water used for livestock, came from groundwater sources, as did approximately 18 percent of public water supplies. Also, the reasons for reliance on groundwater appear to be more from the geography of Virginia than from any legal incentive that encourages groundwater mining. Moreover, few Virginia lands are irrigated, mainly because net returns do not warrant the investment (Daniels). This, coupled with the fact that the primary source for irrigation in Virginia is farm ponds, substantially reduces the number of farms directly affected by the riparian doctrine. While none of the above is conclusive, it suggests caution in assuming that all the theoretical costs of the riparian doctrine are significant in practice.

Problems Associated with Changing Virginia's Riparian Doctrine

If Virginia adopted an alternative water-allocation system, it is not self-evident that benefits would exceed the administrative costs. Indeed, it may be that no change or limited modification to the existing doctrine would be the least-cost alternative. This proposition is strengthened when one considers that any major shifts in doctrine would require the altering of presently held property rights and, perhaps, the disruption of "deeply held values regarding private property". Such a

disruption also alters the previous distribution of whatever wealth stems from having water rights (Ditwiler).

Any decision to change Virginia's laws should follow a systematic analysis of water-allocation institutions which has involved "dissection of the system and the assessment of its performance" on the basis of criteria that realistically reflect the physical conditions of the state and the goals and values of its people (Fox). This analysis should involve looking at both the expected theoretical outcomes and, as experience with the system is gained, the actual outcomes. Several issues associated with changing Virginia's water law would have to be addressed.

The main economic issue associated with modifying the riparian doctrine involves determining whether the benefits of proposed modification exceed the costs of such modification and taking into account the uncertainties inherent in any major change in the distribution of property rights. While "ideal" water-law criteria can be established, there will always be difficulties in translating these into specific statutory provisions. This stems in part from the necessity of making tradeoffs; for example, inflexibility may be the price paid for certainty of water rights.

A change to any system will involve certain elements:

- legal issues associated with changing the riparian doctrine and implementing a new system,
- increased costs of administration and enforcement of the alternative system, and
- new problems in water allocation resulting from implementing the new system.

Legal Issues Associated with Modification of the Riparian Doctrine--Any attempt to improve the institutional

framework for water allocation must be considered within the context of existing institutional arrangements. The primary constraint on change consists of constitutional protection given to private property interests recognized under existing institutions. Several constitutional questions need consideration.

The first concerns ownership of the water resource. Water is commonly referred to as a public resource, and the law of many states contains a statement to this effect. But riparian rights are considered private property, and as such, they cannot be taken

without due process of law and payment of just compensation. However, the precise nature of this property interest varies from state to state and is seldom completely defined.

If a private property right in water is assumed to exist, the next question concerns the extent to which a state's police power can be employed to regulate the right. Water rights, like other forms of property rights, are not absolute; they are limited by the power of government to regulate in the interest of the public health, safety, and general welfare. The extent of this power is difficult to define. One potential application is the restriction of existing water uses. Several states have given full recognition to existing uses when modifying water-allocation institutions, thereby avoiding a constitutional challenge. A second potential application is the restriction of unexercised water rights, including possible abolition of such rights. This action appears analogous to approaches commonly taken in zoning and has been upheld in some states as a valid exercise of the police power in regulating water use. These and other constitutional questions must be evaluated as an element of the feasibility of any water-law change.

Increased Costs of Administration and Enforcement--Because the riparian doctrine is a judicially-enforced system that minimizes bureaucratic costs, transition to an alternative allocation system generally will involve increased expenditures. The most obvious of these costs relates to the administrative mechanisms for making and enforcing allocation decisions. Significant costs also arise from the need for data. Information involving such factors as streamflow and instream flow needs may require substantially increased data collection activities. A further cost consideration is the need for expanded water-resources planning necessary for effective operation of a comprehensive allocation program.

New Problems Resulting from Implementation of an Alternative System--Various alternatives to the existing system can be considered, such as permit systems, marketable rights, or other systems based on economic incentive, and regulatory change in the riparian doctrine; these all have theoretical strengths and weaknesses when compared to the allocative efficiency of the riparian doctrine. As states implement various water laws, they compromise from theoretically "ideal" laws in recognition of unique state problems and political considerations. Furthermore, the modification of the existing institutional structure will produce disruptions that

impose social costs. Therefore, any analysis of the benefits of altering or replacing Virginia's riparian doctrine of water allocation should go beyond theoretical consideration and compare Virginia's existing riparian doctrine with the actual functioning of alternative doctrines. Many systems appear attractive when separated from implementation and operational problems, but the extent of such problems is an important determinant of feasibility and must be considered.

Conclusion

There is not, at present, sufficient information to suggest whether or not the potential benefits of changing Virginia's water law exceed the costs. The riparian doctrine has weaknesses, but, as this paper has sought to demonstrate, merely identifying weaknesses of a doctrine does not in itself justify changing the doctrine.

The authors of this paper are presently engaged in a study that will provide the more detailed analysis of the legal and economic justifications of changing Virginia's water doctrine in order to accommodate resolution of present and foreseeable allocation conflicts. In undertaking the analysis, focus is being placed on the economic costs and legal consequences associated with implementing any proposed change. Information regarding these issues is essential to a rational decision regarding the institutional framework for water allocation in the Commonwealth.

Footnotes

1. This assertion that southeast Virginia "must have the water" can be challenged. "Water does not constitute a barrier to economic development nor does the presence of large quantities of water guarantee rapid growth" (Howe). Further, "Fundamental economic and location factors determine whether a community will grow or decline, and the availability of water-related facilities and services plays a minor role" (Rivken/Carson, Inc.). For further discussion of economic growth and water requirements, as well as demand management issues, see Batie, et al., reference note 2.

References

1. Anderson, W., et al., "Expanded Alternatives for Water Supply in Southeastern Virginia", Special Report No. 2 (April 1978).

2. Batie, Sandra S., William E. Cox, and Leonard A. Shabman, "Interriver Basin Water Transfers: A Supply Management Tool", 16 Land: Issues and Problems (April 1976).
3. Brewer, M., "The Economics of Water Transfer", 4 Natural Resource Journal 522 (1956).
4. Daniels, Denise Gould, "Irrigation in Virginia", Virginia Agricultural Economics, No. 306, Cooperative Extension Service (September 1979), pp. 4-5.
5. Davis v. Town of Harrisonburg, 116 Va. 864, 83 S. E. 401 (1914).
6. Ditwiler, C. D., "Water Problems and Property Rights--An Economic Prospective", 15 Natural Resource Journal 663 (1975).
7. Farnham, W., "The Improvement and Modernization of New York Water Law Within the Framework of the Riparian System", 3 Land and Water Law Review 377 (1968).
8. Fox, Irving, "Institutions for Water Management in a Changing World", 16 Natural Resource Journal 743 (1976).
9. Geraghty and Miller, Inc., Availability of Groundwater in the Southeastern Virginia Groundwater Management Area, Consultants' Report to Virginia State Water Study Commission (1979).
10. Governor's Commission to Review California Water Rights Law, Final Report (December 1978).
11. Howe, Charles, and K. W. Easter, Interbasin Transfers of Water (Johns Hopkins Press, Baltimore, 1971).
12. Howe, Charles, "Water Resources and Regional Growth in the U.S., 1950-1960", Southern Economic Journal (April 1968).
13. Lauer, J. E., "Reflections on Riparianism", 35 Missouri Law Review 1 (1970).
14. Levi, D., "Highest and Best Use: An Economic Goal for Water Law", 34 Missouri Law Review, 165 (1969).
15. Miller, Andrew, Letter from Andrew P. Miller, Attorney General of Virginia, to Thomas J. Rothrock, Member, Virginia House of Delegates (25 April 1972).
16. Murray, C. R. and E. B. Reeves, "Estimated Use of Water in the United States in 1975", U. S. Geological Survey Circular 765, (1977).
17. Rivken/Carson, Inc., Population Growth in Communities in Relation to Water Resources Policy, Springfield, Virginia: NTIS PB 205 248 (October 1971).
18. Trelease, Frank J., "Policies for Water Law: Property Rights, Economic Forces, and Public Regulation", 5 Natural Resources Journal 1, (1965).
19. Town of Gordonsville v. Zinn, 129 Va. 542, 106 S. E. 508 (1921).
20. Code of Virginia of 1950, as amended, sec. 62.1-44.36 (5) (1973).
21. Virginia General Assembly, HJR 236 (1977); SJR 1 (1978).
22. Virginia Hot Springs Co. v. Hoover, 143 Va. 460, 467 (1925).
23. Virginia State Water Study Commission Interim Report (1979).

ALTERNATIVE STRATEGIES FOR IMPLEMENTING AREAWIDE WATER QUALITY PROGRAMS

By Waldon R. Kerns#

The areawide water quality planning process, Section 208 of P. L. 92-500, has been a disjointed set of operations with each independent agency seeming to operate under a separate structure and set of rules, with some plans having little similarity to other plans, often without a common set of goals and objectives. In general, such planning has addressed regional wastewater management or treatment needs and nonpoint sources of water pollution.

The civil and sanitary engineering community has provided volumes of data on measurement and control of most point-sources of pollution. So far, the nonpoint planning process has produced volumes of data on types of pollution and on estimated runoff quantities. To a lesser extent, information on cost-effectiveness of many management practices for both urban and rural areas has been provided.

Cost-effectiveness analysis is defined as finding ways to accomplish a well-defined goal or set of goals in the least expensive way. Or, to put it differently, it means squeezing the most environmental protection from a given budget. This well-developed analysis has most often included only cost of resources used in the mix of technological control strategies. Some important components that have been overlooked from society's standpoint are the associated overhead administrative costs, enforcement costs, continued maintenance costs, costs of obtaining knowledge, and costs of evaluation. Cost-effectiveness analysis without these components is being used in a few cases to choose between nonpoint source or additional point source controls as the most cost-effective means to control pollution loads.

As with any planning exercise, there is little pain in stating general goals or identifying technological control options. What is difficult is performing the necessary

action to achieve the goals by choosing among alternatives and subsequently distributing the cost. These constraints pose serious difficulties for implementing the plans developed under an areawide planning process because difficult decisions involving various trade-offs must be made.

Implementing the plans usually entails significant changes in distribution of rights of producers and consumers (whether industry, farm, or urban home owner) as those rights are based on resource allocation decisions (among owners and government, among levels of government, and among agencies within a government). Some groups or individuals will have to alter their behavior and others will have to bear direct costs to meet desirable water quality goals. In most cases benefits will go to all of us, in small increments, generally broadly distributed. A key determinant of response to management proposals is the level and distribution of costs and the incidence of benefits. Conflicts will always arise when any type of restrictive policy is adopted to achieve environmental quality goals. There has been a definite lack of attention early in the areawide water-quality-program process to implementation procedures.

In analyzing local and state government implementation alternatives for the areawide water quality programs, some digression into past management strategies of this and other environmental programs is needed. Most resource allocation decisions have and hopefully will continue to occur within our system of a market economy. However, because of the external impact of many water quality pollution activities and the public goods nature of some products, many resource allocation decisions during the past have tended to shift to either the courts or to administrative agencies.^{1*} With the creation of administrative agencies--the U. S. Environmental Protection Agency is an

*See Notes, page 82.

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example--much responsibility for resource allocation shifted to administrators. It appears, however, that many resource allocation decisions related to water quality are being shifted back to local areas with oversight by the courts and federal and state administrative agencies.

Federal funds are no longer being committed to control of water pollution or, at least, not in very large amounts. Thus, implementation responsibilities are being shifted more and more to local areas with more state oversight responsibility. Thus, the voluntary nonpoint-source control program is especially advantageous because it permits localities the independence to tailor management strategies to meet their particular needs.

Approach to Implementation

We must recognize that the direct regulatory approach of setting standards of behavior or allowable discharge and that using administrative and judicial means to enforce such standards has yielded important gains in the struggle against environmental harm. However, the critical issue now is whether the direct regulatory approach is the most efficient and equitable means of achieving our goals. Government intervention is clearly justified where it can be demonstrated that the incentives of the market system cannot bring about desired goals; for example, the needed self-restraint with respect to the use of limited resources. But, government intervention without adequate analysis and evaluation has often led to adverse economic impact, including increasing cost of goods and services and impeding private initiative. Progress toward objectives has often been at very high cost.

Since the works of Kneese and his associates in the early 1960s, economists have advocated considering institutional systems of charges, fees, taxes, and numerous other types of incentives and disincentives as alternatives to regulation and control. In this context, statements from a recently completed four-year study of government regulation by a Commission on Law and Economy, whose members were assembled by the American Bar Association,² reinforces the need for these considerations. In general, the Commission recommends that government should rely more upon the competitive market than upon conventional "command and control" techniques for meeting environmental goals. Unlike economists, lawyers have rarely been enthusiastic about market solutions. The Commission said that decentralized tools, such as taxes, disclosure, and bargaining, ought to be considered in place of setting

rigid standards, except to control the most dangerous conditions and substances.

The Council on Wage and Price Stability recently criticized the inflexibility of water quality standards and provided documentation of the existence of unnecessarily costly and inefficient regulations.³ The Council recommended changes that would allow states to weigh incremental costs against incremental benefits of cleaning up a particular body of water. These changes would allow states and localities to possibly forgo large investments in pollution control that would bring only marginal improvements in water quality. Most importantly, localized conditions and the expected costs and benefits of controls would be considered in choosing specific criteria for a given control level.

Emphasis on localized conditions is an important concept in looking at costs and benefits particularly with non-point pollution control. One important aspect of the U. S. Department of Agriculture's Rural Clean Water Program, which is a very small program, calls for socio-economic evaluation and analysis to identify the positive and negative impacts on the landowners in a project area and to estimate the expected community or off-site benefits. Hopefully, this kind of local evaluation and analysis process will be applied to other nonpoint efforts.⁴

Each of these studies suggest that classical standard-setting is difficult to administer and can cause significant anti-competitive and technology-freezing harm. When dealing with spillovers, less restrictive tools should be considered where possible as supplements to, or as partial substitutes for, classical standard setting.

We must recognize, however, that classical command and control regulation techniques may be more appropriate for the control of highly dangerous substances where risks are difficult to gauge and dangers are large. In those cases where the risks are unknown, standards limiting or prescribing the use of such substances may be necessary. But in many areas involving dangerous substances, one might ideally expect that the standards would be set through application of cost/benefit principles. The regulatory agency would first define the adverse effects caused by a specific product or process and then try to identify the particular causal element that it seeks to control, determining where the most good will be accomplished. The agency would next obtain relevant information; then it would write standards designed to optimize the results.

While we generally feel competent to discuss benefits versus costs with respect to most pollution problems, control of toxic substances is treated differently. With toxic substances risk/benefit analyses are conducted, rather than a true cost/benefit analysis. In cost/benefit analysis, all aspects can be reduced to a common unit such as dollars. In risk/benefit analysis, benefits are the total amount that society is willing to pay for the favorable effects⁵ resulting from the regulation or control. It is a tradeoff (or marginal rate of substitution) between how much bodily integrity one wishes to buy while giving up other goods and services. The approach is to consider the expected reduction in mortality or other measure of detrimental effect for each control level and the expected cost of achieving that control. Once we determine how much is spent to save a life in different programs we can determine which program will save the most lives for a given expenditure. This becomes the appropriate tradeoff analysis, not that of placing a value on human life.

In the development of an implementation program for controlling nonpoint pollution in particular, we are basically talking about the best ways to change the behavior of urban and rural land users where benefits of that change accrue to others or to society-at-large. It is imperative that we determine how people will react to various measures or programs designed to facilitate changes. Naturally, reaction to any proposed plan or implementation program will be based on who is affected and how they are affected.

What is the Current Situation?

The current structure of the areawide water quality program provides an opportunity to consider some likely alternatives as supplements to, partial substitutes for, or substitutes for traditional regulatory control. Classical standard-setting and regulation has been used almost entirely for control of point sources of pollution, that is, municipal and industrial sources. For both point and nonpoint sources in urban areas, such tools as source controls and volume control are being implemented through regulation. Source control strategies include cluster development, growth policy, fertilizer management, street sweeping, and road design. Volume control strategies include detention basins and multi-purpose flooding/erosion structures. Strategies to get implementation include comprehensive planning, zoning, acquisition, and review of program effects; for example, upon downstream users, economics of scale in joint use, and growth management. In some cases, tax

schemes have been employed to get source and volume control. But these taxes, usually in the form of preferential assessment, tax rebates, tax deferral, or tax exemptions, have been tied directly to the traditional concept of land-use controls.

In rural areas, classical regulation has and is being used to regulate soil loss and fertilizer and pesticide use. Traditional cost-sharing is being used with these regulations. Of course, numerous best management practices for agriculture have been proposed for voluntary implementation. The U. S. D. A. has proposed comprehensive new approaches but always seem to come back to classical regulation or to a slight change in the cost-share formula. At least differential cost-sharing is recognized, and we need to concentrate on how best to do this for both short- and long-term impacts.

What Are Some Alternatives?

The list of alternatives for or supplements to classical command and control regulation are numerous. Such current efforts as growth management, land use regulations for source and volume control, soil loss, fertilizer and pesticide use control, and most other best management practices may be appropriately classified as classical regulation. Alternatives, of course, include bribes, threats, appeals to self-interest, and persuasion by special recognition. These alternatives must be discussed in another forum.

Let me first comment on two concepts that have recently received some attention--bargaining and threat of litigation. The major advantage of bargaining is that it achieves consensus between those being regulated and the beneficiaries of regulation. Basically each group must determine its priorities and then trade off its less important objectives for those it values more. A major weakness is that there must be some way to force agreement. Also, beneficiaries are most often not organized and information costs become prohibitive. The final decision will affect others not at the bargaining table. Few companies are willing to bargain with private groups on substantive environmental issues. The threat of litigation is often a valuable regulator. But such a threat has serious defects. Litigation is enormously expensive and time-consuming, and the results are likely to vary from court to court when damages are measured.

My primary objective is to provide an evaluation of pricing mechanisms and penalties. Pricing mechanisms include tax

incentives, tax write-offs, credits, loans, subsidies, preferential taxation, and insurance schemes. Penalties include user fees, effluent taxes, effluent charges, and discharge rights. These are discussed under four headings: economic incentives, tax systems, marketable rights, and residuals charges.

--Economic incentives. Economic incentives, such as tax breaks, low interest loans, or subsidies, often induce investment in pollution control facilities. But these are an economically inefficient means of reducing pollution and often amount to little more than a subsidy to producers and consumers of the affected products. To prevent a subsidy or tax benefit policy from degenerating into a general subsidy, the eligible action must be clearly defined. The action must also be limited to a specific treatment process rather than the more general forms of process change, material recovery, and change in consumption patterns that may be part of the optimal control strategy. In many cases, the most efficient way to reduce polluting discharges is to alter production processes, recover materials, produce marketable goods from by-products, or change the nature or quality of the raw material. In order to qualify for an offered economic incentive, firms are discouraged from investigating the widest possible range of alternatives and are most likely to choose a non-optimal set of options. By providing no incentive for process-related changes, subsidies tend to distort investment decisions toward treatment of wastes after they are generated. The Rural Clean Water Program should take a close look at use of subsidies to change production processes. Subsidies in the form of tax writeoffs and credits would probably not benefit marginally-profitable firms. Since subsidies and tax benefits do not cover the full cost of actions, they must always be coupled with some other form of sanction or incentive.

--Tax systems. Tax systems offer a promising approach to spillover problems. The basic problem with spillovers is that the price of a given product, say A, does not reflect the important social cost the product imposes in the form of pollution. The tax raises the price to reflect the harm. The virtue of a tax lies not in its ability to measure the pollution's

cost but in its power to act as an incentive to develop more cost-effective anti-pollution methods. A tax also avoids freezing current technology while preserving a degree of individual choice. This alternative requires both a balancing among goods produced and consumed as well as providing strong incentives to consumers to shift away from pollution-causing products and to producers to shift to, or to develop, pollution-free processes. Relative prices perform just such functions throughout the economy.

A system of taxation is fairly simple in application; but it is important to recognize the problems involved with taxes as regulatory substitutes. One problem is setting the upper and lower bounds of the tax. A tax that is too low is useless. A tax that is too high will discourage production. However, the consequences of a mistake in determining the tax rate are less severe than the consequences of standard setting. A regulatory agency that instituted a tax system would not know in advance how much pollution would be eliminated, since an unknown number of firms could choose to pay the tax rather than eliminate pollution. Taxes are generally thought of as a revenue-raising mechanism, and their use for other purposes is unfamiliar and the public may be reluctant to accept a tax as a substitute for the regulation of pollution. The direct cost imposed may be unacceptable.

--Marketable rights. The marketing of rights is another market-related approach for a local or regional agency to use. To use these, the responsible agency sets an absolute limit on the amount of pollution that can be discharged in a given region and then issues marketable rights to pollute up to the prescribed level. The rights created could be sold to firms, individuals, or groups who would either use them or sell them to others. Rights would be sold and exchanged until they came into the hands of those to whom they were most valuable; namely, the creators of those units of pollution that were most expensive to eliminate. Such an arrangement provides a continuous incentive to adopt production methods that pollute less. The sale of limited rights to discharge pollutants is appropriate where a government or agency decides to reduce the amount of

discharge of an effluent to a given level and would prefer to have the market allocate that amount among potential polluters. The regulatory agency would set an absolute limit on pollution based on the monitoring underway at the time the rights were marketed. Systems based on this principle have been employed in Germany's Ruhr Valley.

--Residuals charges. Residual charges are paid in money. Such charges are imposed on environmentally harmful conduct. By raising the costs of continuing such conduct, the charge helps persuade the entity causing the harm to adopt less costly, more environmentally acceptable means of achieving its goal.¹⁰ Such charges have been used in Germany and Japan but, except for minor experiments, have not been tried in the U. S. Perhaps, the best argument in favor of charges is this: charges are more cost effective than standards or other methods because the total bill that society must pay for the achievement of environmental quality is reduced--more and more a major consideration at this time. Charges are more cost effective because each source decides how much harmful conduct to control on the basis of its own control costs. The average cost of control per unit of pollution would be lower than other regulatory schemes. Regulatory programs could do the same thing but at enormous administrative costs. In setting charges, an agency must have approximate estimates of the cost of controlling each type of pollution or other activity involved. The information needs required by such an agency go beyond current monitoring; but the same type of information that any cost analysis must have is used. Treatment cost functions are needed. If costs are not known, charges are set and changes in quality with respect to a standard are observed. Charges are modified accordingly. The responsible agency that charges the pollutant dischargers for their use of the waste-assimilative capacity of the environment seeks to establish a charge equal to the marginal damage for each unit of pollution. Marginal costs of all options among all discharges are made equal. The resulting charges have the effect of inducing dischargers to choose the least costly combination of all technological options for pollution

control and lowers the total bill that society pays for a desired level of environmental quality.

As we see in these four types of market actions, environmental issues ultimately become economic issues and necessary adjustment costs to individuals and to society-at-large vary depending on the extent of controls and how they are administered and funded. A determination of the economic and financial aspects associated with the attainment of water quality objectives must be a prerequisite to any hopes for adequate control program implementation. Changes brought about by any of the market actions must be analyzed in these terms: How much of a product, such as improved water quality, is socially desirable for any given location? What does it cost in monetary and non-monetary terms to achieve marginal or incremental improvements in water quality? What process will allow tradeoffs to be made between the capacity of the natural environment to process wastes and its compatibility with other desirable uses?

From an equity or distributional standpoint, it is important to know who pays, and how much, as well as who benefits. Successful implementation particularly in non-point water quality programs at the local level will depend heavily on an equitable distribution of the costs and benefits with respect to off-site effects. Most costs are eventually borne by citizens through prices or tax dollars, but who pays, and how much depends on the type of strategies used in the implementation program.

Summary

In summary, tools and techniques are being developed to aid in determining the socially desirable level of pollution, trade-offs among goods and services desired, innovative incentive programs, and ways to facilitate collective decisionmaking where the market does not provide the socially desirable levels of water quality. Policy options other than pure voluntarism or regulation by command and control must be carefully analyzed and utilized before we can expect to obtain desired levels of improved water quality at a reasonable cost to individuals and society-at-large.

Some regulation and control will always be needed for any combination of alternatives. Likewise, the government's or somebody's judgment will always be required. But we need to develop the ability to look quickly and inexpensively at the total range of alternative management strategies that are worth considering for any situation, and then

use the most efficient and equitable means of achieving our goals.

References

1. Richard B. Stewart, "The Resource Allocation Role of Reviewing Courts--Common Law Functions in a Regulatory Era," in Collective Decision Making, (Resources for the Future, Washington, D. C., 1979), pp. 210-213.
2. American Bar Association, Federal Regulation: Roads to Reform, Commission on Law and the Economy, Final Report, 1979.
3. Water Information News Service, "EPA Water Standards Wasteful According to Wage-price Council," Volume 4, Numbers 13-14:1-6, 1979.
4. U.S.D.A., "1980 Rural Clean Water Program", Federal Register 45 F.R. 14006.
5. Arnold L. Aspelin, "Economics of Pesticides and Toxic Substances Control," in Economics of Resource Management and Conflict Resolution in Chesapeake Bay, Virginia Polytechnic Institute and State University and the Citizens Program for Chesapeake Bay, Inc., June 1979, pp. 38-66.
8. A. Myrick Freeman, III, The Economics of Pollution Control and Environmental Quality, (General Learning Press, 1971), p. 19.
7. Resources for the Future, A New Strategy for Environmental Control, RFF, No. 59, April-July 1978, p. 5.
8. American Bar Association, op. cit. p. 61.
9. Ibid.
10. Resources for the Future, op. cit., p. 1.

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