LAND USE POLICY AND AGRICULTURE: A NATIONAL PERSPECTIVE

Melvin L. Cotner

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Melvin L. Cotner. Natural Resource Economics Division, Economic Research Service, U.S. Department of Agriculture. ERS-630.

ABSTRACT

More new cropland is developed each year in the United States than is lost to urban development. While 1.3 million acres are added to the Nation's cropland base each year, only about 500,000 acres are lost to urbanization, public lands (parks, reservoirs, highways), and other intensive uses. However, 2.2 million more crop acres are converted to more extensive uses such as grass and trees because of low soil fertility, terrain unsuited to modern machinery, and small uneconomic fields. This total loss of 2.7 million acres, when weighed against the new cropland developed, gives a net loss each year of 1.4 million cropland acres. This loss is not significant when compared to the national cropland base of 385 million acres and generally rising productivity levels. The United States will be able to meet its anticipated domestic food needs and moderately high export demands. Cropland losses, however, can be significant in local areas, especially where urban uses compete for the better agricultural lands. Public policy is needed to guide this competition and help assure the wise use of agricultural land. While the Federal Government, through its numerous programs and policies, indirectly has an important influence on how land is used, the authority to control private land use unmistakably rests with the States, counties, and municipalities.

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*Melvin L. Cotner**

Preservation of agricultural land is a controversial topic. There is little disagreement that the supply of agricultural land is limited, that the competition for it is increasing, and that public policy is needed to assure its wise use. However, there *is* disagreement over *how far* public land policy should go to maintain privately owned land in agricultural uses.

Some of this disagreement stems from a lack of understanding of all the objectives revolving around the preservation issue. For example, this report focuses on future U.S. agricultural production capacity. But assuring an adequate national food and fiber supply is by no means the only reason to consider policies to preserve agricultural lands. There are also concerns over suburban sprawl, aesthetics, recreation, air and water quality, and the future viability of agriculturally-based communities.

Conclusions I draw here about land use and our future food supply should not detract from the very real concerns over these other vital issues. ***I make this point because our assessment is that the United States will be able to meet its anticipated domestic food needs and moderately high export demands.***

We are approaching our cropland limits

Our current use of land for crop production is about 367 million acres, compared to a 50-year high of 387 million acres used for crops in 1949, a dip to 333 million acres in 1969, and a subsequent rise to 361 million acres in 1974. During 1961-72, land set aside or diverted from crop production under Federal programs ranged from 37 to 65 million acres.

Today, with growing world demand for our food and fiber and in the absence of Federal supply management programs, farmers are edging toward the upper limits of the cropland readily available for use. Future advances in farm output will depend on increases in productivity and development of more cropland through shifts from other uses.

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*The author is Director, Natural Resource Economics Division, Economic Research Service, U.S. Department of Agriculture. This report is based on his presentation at a Conference on Agricultural Land Preservation sponsored by the Institute for Environmental Studies, University of Washington, Seattle, May 1, 1976.

What are the chances for higher productivity?

U.S. farmers have boosted total food output by 50 percent since 1950 by relying more on machinery, fertilizer, and other modern inputs than on the traditional inputs of land and labor. Will this trend continue?

The most obvious hurdle to answering this question is the energy crunch and its impact on fuel and fertilizer supplies for agriculture. But, as recent shortages demonstrated, farmers are likely to get priority energy allotments and, with them, further increases in productivity are possible. The productivity of additional application of fertilizer may not be as effective as in the past.

To make very specific predictions about the advance of technology and productivity is dangerous if not foolhardy. The range of scientific disciplines involved and the varying adoption rates of new technology in agriculture are mindboggling. On the positive side, the following factors are of interest:

- Commercially available hybrids of wheat, barley, and soybeans are not far off.
- Grains are being genetically restructured to enhance their protein quantity and quality.
- Wider adoption of crossbreeding and artificial insemination could spur beef production by as much as 20 percent.
- Substitution of more vegetable protein for animal protein in the human diet would reduce cropland needs significantly. An acre of land in legume crops will produce 10 times the protein for human consumption, compared with an acre in feed grains used to produce protein through beef cattle.
- Weather modification to change precipitation patterns, reduce hail losses, and minimize storm damage appears possible and may significantly influence productivity in the Western regions.

But, mirrored against these and many other potential advances are some definite spoilers. Because of our increasing concern over environment and health, some production inputs such as the pesticides DDT, 1080, aldrin, and dieldrin have been discontinued. Withdrawal of each output-increasing or cost-reducing input lowers production unless substitute inputs are developed and used.

Some climatologists argue that the American farmer has experienced unusually favorable weather patterns over the past 30 years. Less favorable weather for one or two decades could significantly affect our rainfed agriculture.

Another potential constraint on farm output is the price of commercial fertilizer. Like grains, prices of elemental fertilizer nutrients have more than doubled in recent years. As indicated, we expect fertilizer and fuel to be available for agricultural purposes, but higher prices would encourage farmers to use less, thereby reducing production levels.

On balance, higher costs and environmental constraints against incoming technology suggest that our farm yields per acre will increase but at a dampened rate. At best, increases are not expected to exceed the rates of increase of the last three decades.

More crop acres—how many can we develop?

There has been a slight drop in land identified as cropland over the last several decades. Some land drops out because of economic obsolescence and other land is reclaimed. Newly developed land has recently appeared at the rate of about 1.3 million acres a year. This has come about through expanded irrigation, drainage, land clearing, and development of dryland farming. In Florida, it has been through irrigation and drainage. Landowners in the Delta have cleared and drained land. Improved dryland farming techniques in Northern Montana and drainage, clearing, contouring, and leveling in the Corn Belt have added to cropland. And, in Washington, California, and the Texas High Plains, irrigation has been a major factor for new land being added to our cropland base.

But cropland has been released to other uses at the rate of 2.7 million acres a year, especially in the States south and east of the Corn Belt except the Delta and Southern Florida. Low soil fertility, terrain unsuited to modern machinery, and small uneconomic field units are among the reasons for these declines.

Urban encroachment accounts for about 500,000 acres of the cropland loss each year. While large, the loss to urban development is not extremely significant when compared to the existing cropland base of 385 million acres. We develop more new cropland each year than we lose to urban development. But, this loss can be significant in local areas; moreover, urban areas tend to compete for the better agricultural lands and these conversions tend to be permanent.

On balance, average productivity per acre has probably increased because of the cropland change. Much of the new cropland development has been in areas with more productive soils or land better adapted to improved technology. The land dropped from crop uses, except for urban conversion, generally has lower productivity.

Much land that is not presently being cropped potentially could be. A 1967 inventory by the Soil Conservation Service identified almost 266 million acres of tillable land that currently are in pasture, forest, and other uses.

Of the 266 million acres of land with potential for regular cultivation, less than 100 million are considered to be physically well adapted for conversion to cropland within one or two decades. About half of this acreage is in the Great Plains region. If we assume that 100 million acres can be brought into production by 1985, grain sorghum acreage could increase twofold, cotton and citrus acreage could increase by two-thirds, wheat by more than half, soybeans by one-third, and corn by about 20 percent. Pasture acreage could decrease, possibly by 60 million acres.

The basic question concerns what conditions would be necessary to induce production on this reserve of cropable land. It may be more difficult than most anticipate if recent experience is any indication. With acreage limitations removed and farm prices up, no major shifts to bring new land into production have been observed since 1972.

Demand for farmland is mounting; foreign as well as domestic trends are responsible

The demand for food, fiber, and timber products will increase. The growth in basic demand for food, fiber, and timber stems from a complex set of factors:

- World population now exceeds 4 billion and may reach 7 billion by 2000. While population growth rates have diminished in the developed nations, the growth rate tops 2.5 percent in less-developed nations. In the face of rising populations in areas unable to provide enough of their own food, increased commercial and food aid exports will be needed. Our foreign policy may call for more exports and thereby place added stress on our agricultural capacity. The production from 3 out of every 10 acres is now exported for both commercial and food aid purposes.
- U.S. population is expected to reach 264 million by 2000. Population growth rates have been reduced to near the replacement rate. In spite of this fact, sufficient numbers of our population still are, or soon will be, in child bearing age which will continue to increase the absolute levels of population. Also, immigration is a factor in current population growth and could become more important.
- Perhaps an even more important demand factor than mounting populations is growth in incomes. Here and abroad, those with greater wealth and higher incomes demand animal protein diets which spur demand for feedgrains. For example, a third of the world's population—those in the developed nations—use nearly as much cereal for livestock feed as the other two-thirds—in the low-income nations—use directly as food.
- And policies of foreign nations enter the equation. The political decision by the Soviets to purchase grains to cover shortfalls in their production has been felt worldwide the past several years. Their demands on our wheat supplies have been unprecedented.

There are, of course, many other factors, including the agricultural productive capacity of other nations, changing weather patterns, as well as emerging trade opportunities that affect the demand and supply of agricultural land. The demand for production land is much more complex than a simple extension of the demand for agricultural products. Conflicts between competing uses may multiply pressures on our agricultural land base:

- There is a food-energy tradeoff when strippable mineral and energy deposits are located beneath prime land.
- In some areas, competition for limited water supplies from industrial and municipal users may reduce the supply of water for irrigation.
- Use of water for energy production as in coal and oil shale conversion may preclude irrigation or reduce the quality of water for irrigating large areas of potentially productive land.
- Some lands are unique—with special soil, climatic, or location factors which make them well suited for specialty crops. If these lands are converted to nonagricultural uses, domestically produced supplies of these crops may be permanently reduced.
- Urbanization, of course, presents a continuing source of conflicting demand for residential development, open space, waste disposal, industry, and agriculture. At the time of the last Census, nearly 15 percent of all

cropland in the United States lay within areas immediately surrounding our major urban centers.[1]

Implications for Agricultural Land Policy

The evidence suggests that the national agricultural land base is certainly adequate for domestic needs. And sizable world needs can be served. Nevertheless, there is sufficient uncertainty regarding factors affecting future productivity to warrant careful consideration of our policies concerning farmland use and conservation. Potentially important future constraints on production include: energy costs, water availability, increasing costs of nonland inputs, environmental restrictions, a declining rate of advancement in agricultural technology, continued conversion of productive farmland to nonagricultural uses, and volatile export demands.

Perhaps the most compelling justification for increased concern about the conversion of agricultural land to other uses, however, comes not from the national production perspective but from the State and local perspective. Maintenance of land in agricultural uses may serve important public purposes which are not readily apparent when viewing the situation from the national vantage point. Agriculture is very important to the economy of many States and municipalities. Continual use of land for agriculture may be helpful to the maintenance of air and water quality in many areas.

The cumulative weight of the arguments implies that land use decisions should give full consideration to farmland. The implications of this report are:

First, there is an increasing amount of interdependence between land uses and among regions in the use of land.

Second, the traditional market system may not always be sufficient in providing for the wise use of our lands.

Third, land use planning and the coordination of programs at the national, State, and local level are essential if we are to make wise use of our lands.

Fourth, efforts to limit the unwise conversion of agricultural lands to other uses are in the public interest. Our most productive lands should not be withdrawn from agriculture without full consideration of the impact of such actions.

* * * *

In July, 1975, the U.S. Department of Agriculture's Land Use Committee sponsored a Seminar on the Retention of Prime Lands. The purpose of the seminar was to explore the potential implications of the prime lands issue for agricultural and forest lands policy. The seminar participants developed a set of

[1] The phrase, ". . . within areas immediately surrounding our major urban centers," as used here, is a surrogate for the Standard Metropolitan Statistical Area (SMSA) which is a county or group of contiguous counties containing at least one city of 50,000 inhabitants or more.

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recommendations on what the USDA should do to support effective land use decisionmaking:

1. USDA should be an advocate for the conservation of agricultural lands and should encourage State and local governments to undertake efforts to give full consideration to agricultural and forest lands in their land use decisions.
2. USDA should initiate efforts to have prime agricultural and forest lands explicitly considered in environmental impact statements.
3. USDA should encourage the establishment of a Land Resources Council to coordinate Federal programs affecting the use of land. Such a council might be patterned after the Water Resources Council.
4. USDA should intensify its land use research. Research should include studies on the causes and consequences of land use change, and analyses of the effectiveness of programs to maintain lands in agricultural and forest uses.
5. USDA should take action to improve the data base on nonurban lands. Many agencies collect land use data. Such collections should be coordinated so that users nationwide can have access to a consistent set of data with similar assumptions, definitions, and formats.

While the Federal government, through its numerous programs and policies, indirectly has a pervasive influence on how land is used in this country, the authority to control private land use unmistakably rests with the States, counties, and municipalities.

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