

INSTITUTIONS, ORGANIZATIONS, AND POLICIES AFFECTING AGRICULTURE: PRESERVING FARMLAND

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Summary

Soil erosion has fallen because of conservation tillage and other soil saving practices. Public policies such as conservation compliance also have played a role. Key policy decisions await if commodity programs are phase out. Also of concern is stalling of the momentum to conservation tillage. Issues of mandatory versus voluntary, state versus national, and soil erosion versus water quality need to be sorted out.

Private markets alone will not protect farmland, but public policies of the past also often have failed, encouraging urban sprawl into the countryside while creating urban brownfields. The latter are often the unintended consequences of rent controls, flight to the suburbs, and fragmented metropolitan government. Sprawl into the countryside is partly the product of under-priced rural services and subsidized infrastructure, gasoline, and mortgage interest. A useful step to better land allocation, full marginal cost pricing, would slow movement of people into rural areas. PDRs also can augment the market by compensating farmland owners for holding land in agriculture. The cost is rightly borne by the public which benefits from preserving rural landscape and not by farmland owners who prefer to sell to the highest bidder.

Counties and townships can exercise greater authority over road access and utility hookups to complement PDRs, and use zoning and full cost pricing in a comprehensive package for guiding development. The purpose is to channel development away from prime farmland and reduce sprawl rather than halt development. It is important to keep in mind that severe restraints on development can sharply raise costs of housing and offices for nonfarm people, causing hardships.

1. Introduction

Preserving farmland has (1) quantity or depletion and (2) quality or degradation dimensions. The first refers to conversion of farmland to alternative uses including

urban development. The second or degradation dimension refers to soil erosion. Each of these dimensions has market forces and public regulation aspects.

Governments have been active in promoting soil conservation and preserving farmland. That activity and the thinking behind it are presented in this paper, drawing especially on the experience of the United States.

2. Soil Conservation

Soil conservation has long been regarded as the most serious environmental problem in American agriculture (Gardner, p. 9; Tweeten, 1984). Soil erosion reduces productivity of land, fouls waterways, and silts up reservoirs. Erosion carries along pesticides and nutrients such as nitrogen and phosphate that degrade water quality.

In the United States, emphasis turned to natural resource conservation at the end of the 19th century with the closing of the western frontier. Attention turned from expansion at the exhausted extensive margin of cropland area to expansion at the intensive margin of yield per hectare.

Maintaining and expanding yields required, along with science and technology, natural resource conservation. Modest efforts began under President Theodore Roosevelt at the end of the 19th century. Public policy initially focused on setting aside lands for protected public forests, grazing lands, and parks.

Conservation made a quantum leap with the New Deal of President Franklin Roosevelt in the 1930s. The “dust bowl” of the Great Plains characterized by extensive wind erosion combined with growing recognition of the past toll taken by water erosion on the nation’s cropland base fueled the Great Depression era social and political activism. One result was the Soil Erosion Service established in 1933 in the US Department of the Interior. Numerous Civilian Conservation Corps (CCC) camps were established and operated by the Service to plant trees and provide care for natural resources. A large number of demonstration projects were established, hundreds of thousands of small check dams were built, and roads were constructed (Benedict, p.318).

In 1935 the Soil Erosion Service was transferred to the US Department of Agriculture and became the Soil Conservation Service (SCS). The Soil Conservation Service continued to operate much like an independent agency and was concerned specifically with problems of conservation. In 1937 the Service began a program of cooperation with soil conservation districts set up under state laws. It provided comprehensive farm plans and technical assistance that included classification of soil and surveying for drainage tile, terraces, and water storage dams. Economic assistance under the Agricultural Conservation Program provided payments for part of the cost of terracing, land-forming, stock dam building, and irrigating and draining soil.

More than half of the federal outlays for the Agricultural Conservation Program from 1948-1958 were cost-sharing assistance for liming and fertilizer materials and for drainage and irrigation. These output-increasing outlays, which remained at nearly the same annual level from 1948 to 1965, ran counter to the need to reduce surplus

commodity production, conserve soil, and preserve farms. Most of the payments went to farms that were larger than average (Cotner, pp.4,16). Many of the supported conservation practices were profitable without assistance. Later, government assistance was turned to technical assistance and to long-term investments to reduce erosion rather than to raise output.

The Rise of Sustainable Agriculture and the Environmental Movement

The income elasticity of demand for environmental protection is high. An affluent society can afford to protect its resources, and can generate the science and technology to do so. The nation that had heard and responded to the “call to arms” after the closing of the frontier in about 1890 and to the dust bowl in the 1930s was awakened in the 1960s with student unrest and fast-paced change of technology that left many bewildered. One of those technologies was agricultural chemicals. A landmark book, Rachael Carlson’s *Silent Spring*, provided a few facts and abundant emotional appeal to energize the environmental movement in the 1960s. Emphasis shifted to concern over chemicals in the food system, but such concern could not be separated from soil conservation.

In agriculture, the terms “sustainable”, “low input sustainable”, and “alternative agriculture” entered the vernacular. The terms were defined in innumerable ways. Many would agree with Ikerd et al. (p.40) that sustainable agriculture is distinguished from conventional agriculture by differences in values, attitudes, goals, and objectives. For some deep ecologists, “sustainable” meant organic farming.

More often, however, the sustainable agriculture movement carried a deep concern for preserving soil and water with practices including (Tweeten, 1992):

- Crop rotations, preferably including forage legumes for green manure to cut soil erosion and reduce needs for pesticides and commercial fertilizer.
- Integrated pest management to reduce pesticide use by applying chemicals only as economically justified, and using biological controls where possible.
- Conservation tillage leaving 30 percent or more of crop residue on the soil surface to reduce erosion.
- Integrated crop-livestock systems that utilize livestock to consume forage legumes, supply fertilizer, utilize off-season labor from crops, supplement family income, but avoiding high density confinement systems.

Although some sustainable agriculture advocates were dogmatic, most farmers and politicians remained pragmatic. Policies continued to emphasize voluntary conservation measures, inducing producers to participate by offering public financial inducements rather than rigid regulations. The sustainable concept, holistic in its environmental perspective, broadened its scope beyond soil conservation to include water quality and wildlife preservation.

Concern about water quality and wildlife preservation coupled with the doubts by the environmental movement in the 1970s whether the US Soil Conservation Service (SCS) was sufficiently activist nearly cost the agency its existence in the 1970s and early

1980s. The agency was saved by grass roots support from its conservation districts, by support from the Environmental Protection Agency, and by changing its name to the Natural Resource Conservation Service (NRCS) to reflect its widening role in protecting water as well as soil resources. This resurgence prompted Knutson et al. (p.294) to label the NRCS "... one of the more powerful USDA agencies." Its role continues to be mainly education and technical assistance, working closely with producers and with other public agencies such as the Farm Service Agency (which administered farm programs) to determine eligibility and priorities for funding of environmental protection programs.

Commodity Programs as Vehicles for Soil Conservation

Commodity programs have multiple goals in addition to raising farm income. One goal, to conserve soil, is secondary but is often used to justify income transfers to farmers. The first major commodity program legislation, the Agricultural Adjustment Act of 1933, was declared unconstitutional by the US Supreme Court and had to be replaced by the Domestic Allotment and Soil Conservation Act of 1936. The latter was similar to the 1933 Act but justified price supports and production controls in the name of soil conservation—by serendipity the crops that were in excess supply and needed price supports and production controls just happened to be the same crops that needed to be reduced in area to cut soil erosion.

A National Research Council (pp. 69-77) report on *Alternative Agriculture* heavily attacked farm commodity programs for encouraging chemical use and excessive cultivation (and attendant erosion) to achieve high yields. In fact, government commodity programs had a mixed impact on the environment. Especially since the 1985 farm bill, government commodity programs have attempted to correct externalities. That bill required farmers receiving commodity program benefits to adhere to a "swampbuster" provision that kept them from draining and cropping wetlands, a "sodbuster" provision that kept them from converting noncropland to cropland, and a "conservation compliance" provision to establish a conservation plan for highly erodible cropland and subsequently to follow that plan. The programs were voluntary in that a farmer could reject compliance by rejecting commodity program participation, but commodity program payments were so generous that few farmers could turn programs down.

Conservation compliance programs speeded adoption of conservation tillage which saved soil from erosion by leaving crop residue on the surface. But programs also created incentives to raise yields by using more pesticides and commercial fertilizers per hectare, thereby adding to water quality problems (see Gardner, p. 18). Enforcement of environmental provisions was lax so the programs probably had only a modest net positive environmental impact—at least relative to the huge outlays of public funds (see Cook and Art).

The Conservation Reserve Program (CRP) was a long-term (usually 10-year contracts) general land retirement program paying farmers to convert cropland to soil conserving uses. The CRP of the 1985 farm bill was a revival of a similar program that operated in the 1960s. The CRP relied on a system of bids for participation that resulted in much

land removed from crop production nationwide but especially in the Great Plains. This latter area was not as productive as other cropland on average, hence CRP removed a higher proportion of crop area than production. CRP was a sizable program converting nearly one-tenth of US cropland to soil conserving uses. Peak CRP area in the 1990s was 15 million hectares at a cost of \$1.8 billion per year or an average of \$120 per hectare.

On-farm cost of soil erosion averaged from \$500 million to \$1.2 billion (see Sanders et al., p.14) and costs are internal, whereas off-site damage averaged a far higher \$2.2 billion (Clark et al.) to \$7 billion (Ribaud). Recognizing that internal costs would motivate proper decisions by farmers, but that off-side externalities would not be addressed by markets, a greater proportion of CRP funding in the 1990s was shifted to riparian strips of grass and trees along stream banks to hold and filter soil and chemicals before water entered streams. A modest size Wetlands Reserve Program patterned after the long-term CRP also was initiated in the 1990 farm bill. It paid landowners to convert areas to wetlands to “filter” soil sediment and chemicals before water moved downstream.

The Conservation Reserve Program has been criticized on several grounds. Cost-effectiveness was low: the program could have controlled more soil erosion, further improved water quality, or removed more land from production if it had been better targeted. Overall costs exceeded benefits. Borrowing individual numbers from various sources, I estimate CRP economic benefits and costs per hectare per year in Table 1 below:

<i>Benefits</i>	(Dollars/ha/yr)
Less downstream sedimentation, clean water	17
Air quality	3
Recreation	48
Timber	30
Reduced on-farm erosion	9
Less flooding, irrigation ditch drainage, etc.	6
Wildlife preservation	11
Total	124
<i>Costs</i>	
Higher food costs	104
Deadweight cost of income transfer (20% of payments)	33
Established cover crop	9
Crop damage from CRP wildlife	4
Total	150
Source: Estimates from Huszar, Osborn, Ribaud, and others summarized by Feather et al., p.6.	

Table 1

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