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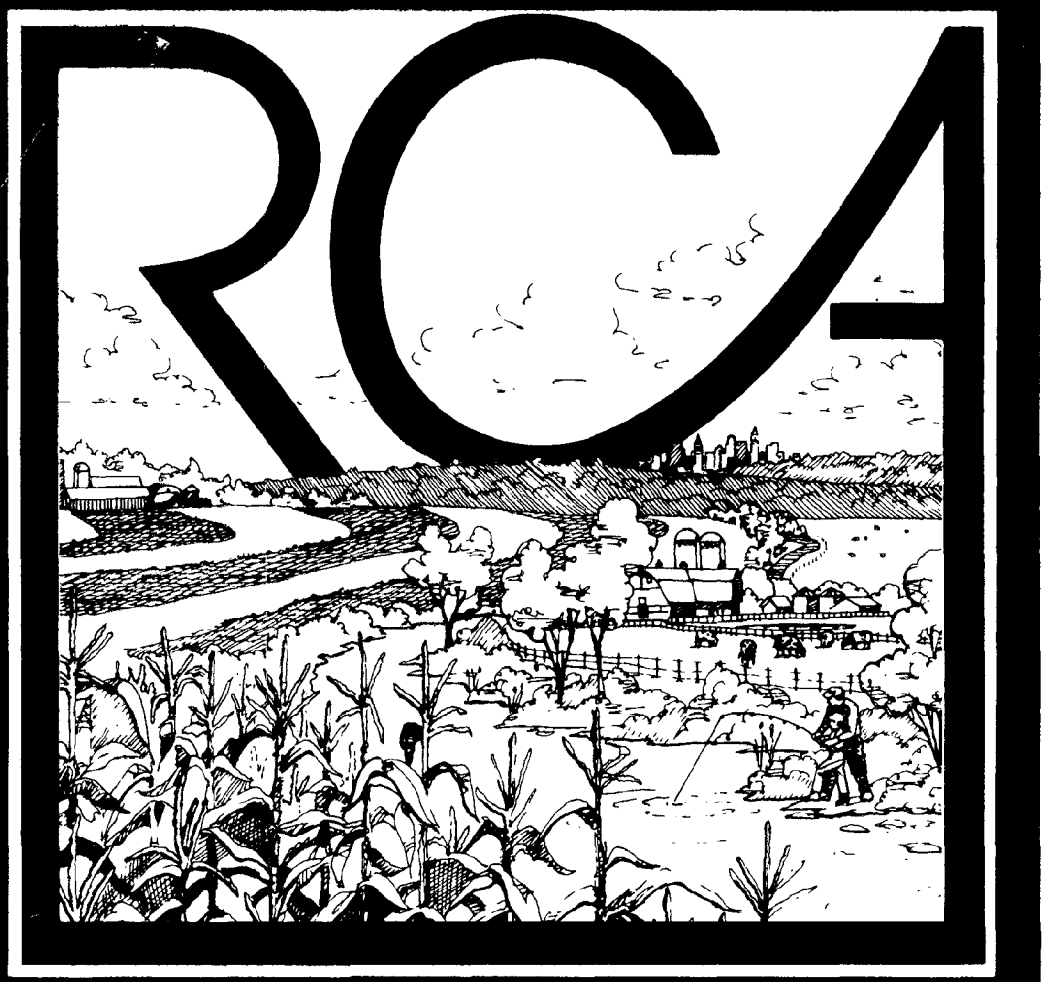
United States Department of Agriculture

1981 Program Report and Environmental Impact Statement

Revised Draft

Soil and Water Resources Conservation Act



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SOIL AND WATER RESOURCES CONSERVATION ACT

PROGRAM REPORT AND ENVIRONMENTAL IMPACT STATEMENT

Revised Draft

United States Department of Agriculture

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REVISED DRAFT PROGRAM REPORT AND ENVIRONMENTAL IMPACT STATEMENT
FOR A
NATIONAL SOIL AND WATER CONSERVATION PROGRAM

Prepared in response to Section 6 of the
Soil and Water Resources Conservation Act of 1977 (RCA)
by
The United States Department of Agriculture

Abstract: Section 6 of Public Law 95-192, the Soil and Water Resources Conservation Act of 1977 (RCA), requires the Secretary of Agriculture to develop a national soil and water conservation program to guide the Department's future conservation activities on the Nation's private and other nonfederal lands. This document, prepared in response to the Act, is based on an appraisal of existing resource conditions and trends and projected resource needs. It discusses the status of soil, water, and related resources; identifies resource problem areas; analyzes the effectiveness of existing conservation programs; establishes objectives for a national soil and water conservation program; develops alternative programs for meeting these objectives; assesses environmental impacts that would result from implementing the alternative soil and water conservation programs; and presents the procedures under which the new programs would be evaluated. In preparing the appraisal, program report, and environmental impact statement, the Department of Agriculture considered fully the views expressed by the public through public participation activities. This revised draft presents a preferred program and two alternatives that the Department considered in response to the Act. The preferred program provides for continuing the programs of the Department of Agriculture with redirection of some funds and personnel, encouraging state and local governments to assume additional responsibility for developing and implementing conservation programs, and giving priority to protection of soil resources and reduction of upstream flood damage. The two alternative programs are (1) continuation of current program trends, and (2) redirection of the present program with an emphasis on high-priority resource problem areas.

Comments on this document should be sent to the appropriate state office of the Soil Conservation Service. A preaddressed response form is supplied for this purpose. The Soil Conservation Service will consider all comments mailed no later than January 15, 1982, in formulating the final soil and water conservation program. For further information, contact the Soil Conservation Service, Washington, D.C., (202) 382-8059.

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CHAPTER 1
EXECUTIVE SUMMARY

The United States Department of Agriculture (USDA) prepared this Revised Draft Program Report and Environmental Impact Statement in response to provisions of the Soil and Water Resources Conservation Act of 1977 (RCA). This Act requires the Secretary of Agriculture to appraise the condition of the soil, water, and related resources on the nonfederal lands of the United States and to develop a national soil and water conservation program to guide USDA's future conservation activities on those lands.

Passage of the Act followed a growing awareness of the seriousness of resource problems in the Nation. American agricultural production has doubled in just the last 30 years in response to domestic and foreign demands for agricultural commodities. So far, American farmers have been able to meet those demands, but unless the resulting pressures on the Nation's agricultural resources are relieved, tomorrow's farmers may not be able to. Chapter 2 of this report outlines the need for action.

In the Act, Congress asked the Secretary three basic questions:

- What are the resource problems?
- How do you propose to solve these problems?
- What are the expected results of your solution?

The Problems

The Secretary conducted an appraisal to determine the status, condition, and trends of the Nation's soil, water, and related resources. The 1980 RCA Appraisal showed that conservation problems threaten to reduce agricultural productive capacity and increase production costs. Specific findings of the Appraisal include:

- Much agricultural land is eroding faster than the soil can rebuild itself through natural processes. Unless corrective actions are taken, the acreage of this excessively eroding land will increase further.
- Floods threaten human life, property, livestock, and crops in upstream watersheds. The likelihood is for greater damage in the future.
- Depletion of ground water threatens the continuation of irrigated agriculture in extensive areas of the West.
- Deterioration of water quality limits potential use of water for irrigation, municipal and industrial supply, fish and wildlife habitat, and other purposes.

The 1980 RCA Appraisal is a detailed record of these and other resource problems and conditions. Chapters 3 and 4 of this report summarize the 1980 Appraisal. Chapter 5 presents the results of evaluations of several USDA conservation programs and recommends improvements.

The Solutions

Armed with appraisal data, analyses of resource condition, evaluations of existing programs, and the results of public participation activities, the Secretary set major objectives and established priorities for future soil and water conservation activities. He reviewed alternative ways for dealing with current and projected resource problems, and selected a preferred program.

The foundation of the preferred program is greater cooperation among local and state governments and the federal government in solving conservation problems and redirecting present programs. Cooperative solutions to conservation problems are not new. Local conservation districts and ASC and extension advisory committees have worked closely with their local USDA offices for years to provide assistance to land owners. The preferred program retains these existing organizations and relationships to recognize and solve conservation problems.

The program moves away from the "cafeteria," or "first come, first served," approach of traditional USDA conservation programs. It addresses instead specific national resource priorities. It targets soil conservation activities, reducing the most serious erosion and correcting related resource problems that impair the Nation's agricultural productivity.

The preferred program--

- o establishes clear national priorities for addressing problems associated with soil, water, and related resources over the next 5 years. The highest priority is reduction of soil erosion to maintain the long-term productivity of agricultural land. The next highest priority is reduction of flood damages where risks are highest in upstream areas. Water conservation and supply management, water quality improvement, and community-related conservation problems have next priority. Fish and wildlife habitat improvement and organic waste management are an integral part of solutions to these problems.

- o strengthens the existing partnership among land owners and users, local and state governments, and the federal government. Through this partnership, the program--

    - provides federal matching block grants to states for an expanded role in developing and implementing conservation programs, the federal funds to be obtained by reducing current federal conservation program funds.

    - provides for a Local Conservation Coordinating Board made up of representatives of the conservation district, county ASC committee, extension advisory committee, and other interested parties. This board will appraise local conditions and needs and develop a program

through existing local, state, and federal institutions. The local board will identify critical resource problem areas and set priorities for action to achieve program objectives.

- provides for a State Conservation Coordinating Board, with members appointed by the Governor, to appraise overall state resource conditions and needs. This board will build on local programs in identifying statewide critical problem areas, setting priorities, and developing the state program.

- establishes a USDA National Conservation Board to advise the Secretary of Agriculture on conservation matters.

- bases state and federal cooperative conservation actions on an agreement between each Governor and the Secretary of Agriculture.

o provides for increased and more efficient cooperation and budget coordination among USDA agencies with conservation program responsibilities.

o continues or initiates actions to--

- target an increased proportion of USDA conservation program funds and personnel to critical areas where soil erosion or other resource problems threaten the productive capacity of soil and water resources.

- emphasize conservation tillage and other cost-efficient measures for reducing soil erosion and solving related problems.

- evaluate tax incentives as an inducement to increased use of conservation systems.

- increase emphasis on technical and financial assistance to farmers and ranchers who plan and install needed and cost-efficient conservation systems.

- target USDA research, education, and information services toward problems that impair agricultural productivity, while continuing basic research into the cause and cures of resource degradation.

- set up pilot projects to test new solutions to conservation problems.

- require land owners to have a conservation plan in order to be eligible for Farmers Home Administration loans.

- minimize conflicts among features of USDA farm programs that limit achievement of conservation objectives.

- strengthen collection and analysis of resource data.

- evaluate and analyze conservation progress.

- expand the use of long-term agreements in providing conservation assistance to farmers or ranchers.

In addition to the preferred program, the Secretary looked at many options and developed and considered two other alternatives. (1) Under the first of these alternatives, current trends in USDA soil and water conservation programs would continue. These trends, if continued, would result in lower funding and further degradation of soil, water, and related resources. (2) Under the second alternative, USDA would redirect its programs so that it would target a larger share of its assistance to solving critical resource problems. Resource conditions would at best improve only slightly from what they are now.

The Secretary rejected these alternatives as too weak to solve the problems and unresponsive to public opinion.

Chapter 6 shows the alternatives and options that the Secretary developed and considered. Chapter 7 presents the Secretary's preferred program.

What to Expect

As a result of implementing the Secretary's preferred program, the following can be expected:

- Conservation efforts will be more effective because they will be planned and carried out in response to clear objectives and priorities.

- Emphasis on cost-efficient solutions to conservation problems should increase the acceptance and adoption of conservation methods and accomplish more for each private and public dollar spent.

- The loss of soil and water resources will be slowed but not reversed. Implementing a program to reduce degradation of soil to tolerable limits would be prohibitively expensive.

- State and local governments will have a steadily expanding role in developing and implementing conservation programs.

Chapter 8 outlines the environmental, economic, and social effects that would likely follow implementation of the preferred program.

Program Evaluations

Once the program is in place, USDA will conduct continuing evaluations to ensure that all of its conservation activities are effective and well managed. Each agency will evaluate the specific programs for which it is responsible. Annually, the Chief of the Soil Conservation Service will prepare an RCA evaluation report for consideration by the Secretary and transmission to the Congress. Chapter 9 outlines procedures for evaluating USDA's soil and water conservation programs.

Consulting the Public

The Secretary has consulted the public at key points during program development. Public opinion has helped to shape the preferred program and is essential to preparation of a final program that the people of the Nation can encourage and support. Chapter 10 outlines public participation activites conducted to date, presents a list of those who prepared this report, and shows who received copies.

How to Comment

USDA has distributed 30,000 copies of this program report and 400,000 copies of a summary of this report nationwide. The summary includes a form that you can use for commenting on provisions of the preferred program. Please mail your comments to the appropriate state office of the Soil Conservation Service no later than January 15, 1982.

The Secretary welcomes your comments and will consider them in developing the final program as required by the Act.

CHAPTER 2
WHY ACTION IS NEEDED

World food and fiber production and consumption increased at unprecedented rates in the last three decades. Foreign production of agricultural commodities increased from 540 million metric tons in 1950 to more than 1.3 billion metric tons in the late 1970's; consumption increased from 555 million tons to more than 1.45 billion tons. Agricultural exports from the United States increased ninefold--from 16 to 145 million tons. Total U.S. production doubled, reflecting a slower rate of growth in domestic demand relative to world demand.

American farmers and exporters have developed a world market for their commodities. This market has been a major influence on farm income and has helped reduce the deficit in the Nation's balance of trade. With the expected growth in world population, the outlook for commodity demands and consumption over the next decade or two indicates a continued strong expansion of U.S. production in response to world demands. It also indicates increasing pressures on the Nation's available cropland, pastureland, rangeland, forest land, and water for agricultural production.

Food prices will rise if world population and income grow more rapidly than world food production. Any extensive use of cropland to produce biomass for energy rather than food would likewise drive food prices up. Rising energy prices would also increase food prices because the costs of production would increase.

The forecasts of foreign demand and supply suggest that the 1980's, like the last 5 years, will be a period of record or near-record growth in demand, slower growth in production, and increased dependence on supplies from the United States.

Domestic demands are basically influenced by population and income trends. Declining birth rates and slowing of real rates of economic growth in the United States suggest a slower growth in domestic food consumption over the next several years than in recent decades. In addition, any extensive use of domestic agricultural commodities as biomass for energy production would increase total domestic demands for agricultural commodities.

Considering both foreign and domestic demand together, it is clear that use of American agricultural resources will intensify and expand to produce more agricultural commodities. The United States has the resources and capability to expand production of agricultural goods. The extent of that capability will be influenced most significantly by the rate at which agricultural productivity can be enhanced through existing and emerging technology. It will depend to a lesser degree on the extent to which society can limit the steady shift of agricultural land, especially cropland, to nonagricultural uses. The success of efforts to slow conversion of agricultural land will be influenced strongly by the availability, suitability, and location of non-agricultural lands for these other uses and by the actions that states and communities take to guide such development.

Above all, there is a need to protect and maintain the productivity of agricultural lands through actions that prevent gradual degradation caused by excessive soil erosion. Soil erosion occurring at rates that could reduce the sustained productive capacity of agricultural lands is the most critical of the resource problems identified in the RCA Appraisal. Although increases in agricultural productivity through application of technology may temporarily and partially offset yield losses attributable to erosion, erosion should be kept at a tolerable level. Continued excessive erosion will reduce the capability of the Nation's agricultural soils to respond to the available technology and produce yields that reflect their full productive capacity. Programs for more effective erosion control should be emphasized to prevent loss of this productive capacity.

Changing Perspectives

Given these prospects for demand and supply, the emphases of food and agricultural policy and the day-to-day concerns of managing this policy will focus strongly on avoiding or overcoming shortages, encouraging production, and enhancing productivity. The conservation and wise use of land and water resources--including the reduction of soil erosion and sedimentation, preservation of prime agricultural lands, prevention of flood damages, conservation of water used in irrigated agriculture, enhancement of water quality, and conservation and production of energy--must be an integral part of future food and agricultural policies and production practices.

The Soil and Water Resources Conservation Act of 1977

Recognizing the growing pressures on agricultural soil and water resources and the need to improve the effectiveness of soil and water conservation efforts, Congress enacted the Soil and Water Resources Conservation Act of 1977 (RCA). The Act directs the Secretary of Agriculture to make an appraisal of the soil, water, and related resources of the Nation. The federal government, state soil and water conservation agencies, land owners and users, local units of government, and others will use the appraisal in making informed long-range policy decisions regarding soil and water resources.

The Act further directs that programs administered by the Secretary of Agriculture for the conservation of soil, water, and related resources be responsive to the long-term needs of the Nation, as determined by the appraisal. It requires the Secretary to--

- develop and periodically update a program for conserving, protecting, and enhancing soil, water, and related resources consistent with the roles and responsibilities of other federal agencies and state and local governments.

- provide Congress and the public with the appraisal and program report and provide Congress with an annual evaluation report.

In response to the Act, the United States Department of Agriculture developed procedures to--

- o appraise soil, water, and related resources.
- o project future demands on and requirements for these resources.
- o provide for public participation.
- o analyze the appraisal and the projected demands on these resources.
- o define specific resource problems.
- o establish feasible soil and water conservation objectives to resolve the problems.
- o develop and compare alternative programs to achieve the objectives.
- o select a program for implementation.

This Revised Draft Program Report and Environmental Impact Statement presents the Secretary's preferred program and the other alternatives that were considered. It differs from the 1980 Draft Program Report and Environmental Impact Statement, which focused primarily on conceptual strategies.

CHAPTER 3
THE STATUS, CONDITION, AND TRENDS OF SOIL, WATER, AND RELATED RESOURCES

One of the first steps in meeting the requirements of the Soil and Water Resources Conservation Act of 1977 (RCA) was to compile data on the quantity, quality, and use of soil, water, and related resources in the United States. These data provide an accurate picture of the present condition of these resources and serve as the basis for analyses of resource problems. This chapter summarizes Part I of the 1980 RCA Appraisal.

Major Resource Uses

Soil Resources

There are 1.5 billion acres of nonfederal land in the United States (3) (fig. 3-1). The use of this nonfederal land is changing (table 3-1). The acreages in cropland and forest land are decreasing, while the acreages in pastureland and rangeland are increasing. The acreage devoted to urban, built-up, and transportation uses is increasing at a growing rate. From 1958 to 1967, the acreage in cropland decreased from 449 to 438 million acres--slightly over 1 million acres annually. In the following decade, this acreage decreased an additional 25 million acres. Recent data, however, show that this trend has changed. Since the mid 1970's, the acreage in cropland has been increasing.

Across the Nation, residences, factories, shopping centers, roads, and related structures now stand on land that once supported crops, trees, or grass. From 1958 to 1967, about 10 million acres of rural land were converted for these purposes. Between 1967 and 1977, another 29 million acres were converted. Each acre of land claimed by development may mean that one additional acre or more is isolated and lost for food or fiber production. Once converted, such lands cannot be farmed again without extensive and costly reclamation. About one-third of the land converted, nearly 1 million acres per year, is prime farmland.

Nearly 1 billion acres of nonfederal rural land are not now cropland. About 127 million acres have medium or high potential for conversion to cropland. This land is now mostly rangeland, pastureland, or forest land. Considerable investment would be required to convert the 91 million acres rated as having medium potential.

Water Resources

Each year, an average of 30 inches of precipitation falls onto the conterminous United States. This precipitation is unevenly distributed, ranging from less than 4 inches annually in parts of the Great Basin and Lower Colorado regions to more than 200 inches in the coastal area of the Pacific Northwest (6).

Table 3-1.--Trends in the use of nonfederal land and small water areas, 1958, 1967, and 1977 1/

Land use	1958	1967	1977
	(millions of acres)		
Cropland	449	438	413
Irrigated	(37)	(44)	(58)
Nonirrigated	(412)	(394)	(356)
Pastureland and rangeland	486	483	548
Pastureland	(2/)	(102)	(134)
Rangeland	(2/)	(380)	(414)
Forest land	453	463	377 3/
Urban land (over 10 acres) and rural transportation	51	61	90
Small areas of open water	7	7	9 4/
Other	67	57	88 5/
Total	1,513	1,509	1,525

1/ Some land use definitions changed slightly from one inventory to another. See individual source document for the land use definitions in effect at the time of inventory.

2/ Data not available.

3/ Part of this change is caused by a redefinition of the land use.

4/ 1977 data include 1 million acres of water bodies covering less than 2 acres.

5/ 1977 data include 4 million acres of built-up land covering from one-fourth acre to 10 acres.

Sources: 1958 data from basic statistics of the 1958 National Inventory of Soil and Water Conservation Needs. 1967 data from basic statistics of the 1967 National Inventory of Soil and Water Conservation Needs. 1977 data from 1977 National Resource Inventories (3) adjusted to include Alaska.

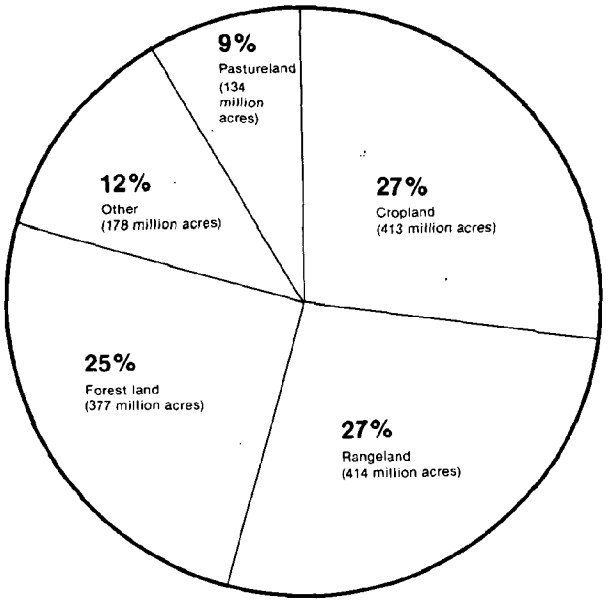

Figure 3-1.--Use of nonfederal land in the United States and Caribbean Area, 1977 (2, 3).

Most areas in the western half of the United States receive less than 30 inches of precipitation a year, but seasonal and year-to-year variations tend to be greater there than in other regions. To increase water supply in the West and in other parts of the Nation, dams and reservoirs have been constructed, upstream watersheds managed, water transferred between regions, and ground water sources tapped.

The total area of surface water in the United States, including the Great Lakes and coastal areas, is 108 million acres. Surface waters yield more than 250 billion gallons of water daily in withdrawals. Total ground water withdrawals exceed 80 billion gallons per day, including 21 billion gallons per day of ground water withdrawals in excess of natural recharge. In 1975, ground water withdrawals accounted for about one-fifth of the fresh water consumed in the United States.

Agriculture is the Nation's largest consumer of water. Four times more water is consumed to produce food and fiber than for all other purposes combined. Although grown on only about 12 percent of the Nation's cropland, irrigated crops account for about 25 percent of the total value of crop production in the United States (4). Figure 3-2 shows where irrigation is concentrated in the United States, and figure 3-3 compares the acreages of irrigated and nonirrigated cropland, by crop production region.

Related Resources

Soil and water are the Nation's basic natural resources. Related resources help meet a variety of agricultural, environmental, esthetic, and recreational needs and values. Such closely related resources--organic residues, wetlands, fish and wildlife habitat, and recreational areas, for example--affect and in turn are affected by the basic resources.

Major Resource Problems

Soil Erosion

Many soils, including some of the most productive, have been and continue to be severely eroded. 1/ Erosion can reduce soil productivity if it occurs faster than the topsoil can be replenished through natural processes. As a rule of thumb, on deep soils commonly used for cropland, pastureland, and forest land, 4 or 5 tons of soil per acre can be lost annually without damaging the soil's productive potential; on the thinner and more fragile soils commonly used for rangeland, only 2 or 3 tons per acre can be lost annually. Holding erosion within these rates permits sustained use of the soils. In recent decades, increases in productivity as a result of improved technology have masked the effects of soil erosion on crop yields.

1/ Soil erosion is usually measured or estimated in terms of tons of soil moved per acre annually. A ton of soil is roughly equivalent to a cubic yard. A one-inch layer of soil over one acre weighs about 150 tons. Thus, a soil losing 5 tons per acre annually would lose an inch in about 30 years. Topsoil thickness generally ranges from a few inches to a few feet.

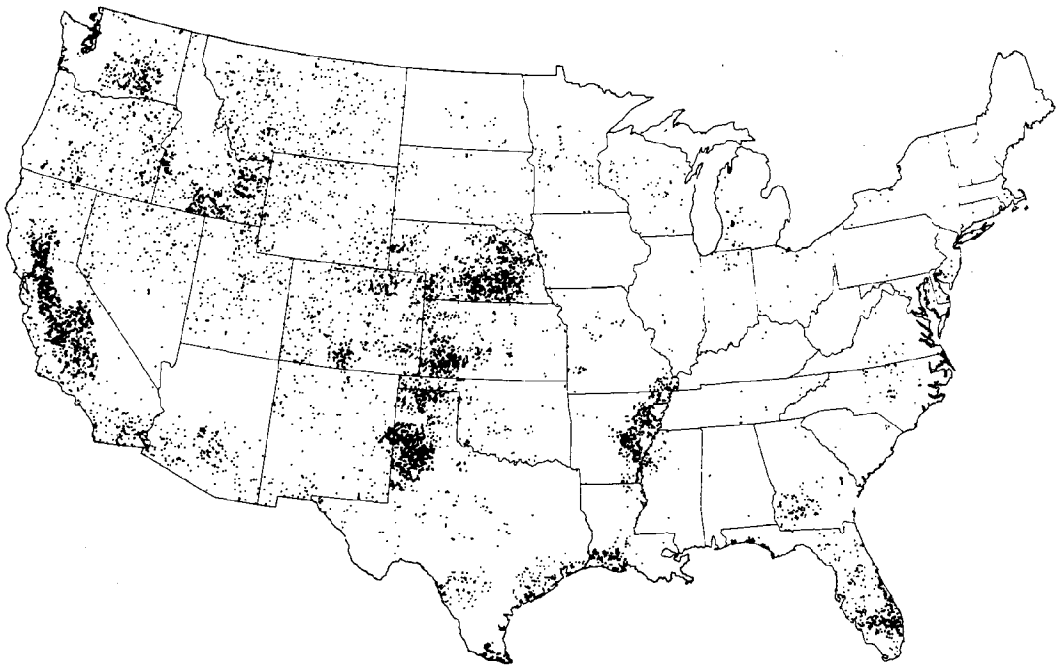

Figure 3-2.--Irrigated acreage in the United States, 1977. One dot equals 8,000 acres where irrigation facilities are in place. Total irrigated land equals 58 million acres, 1977 (3).

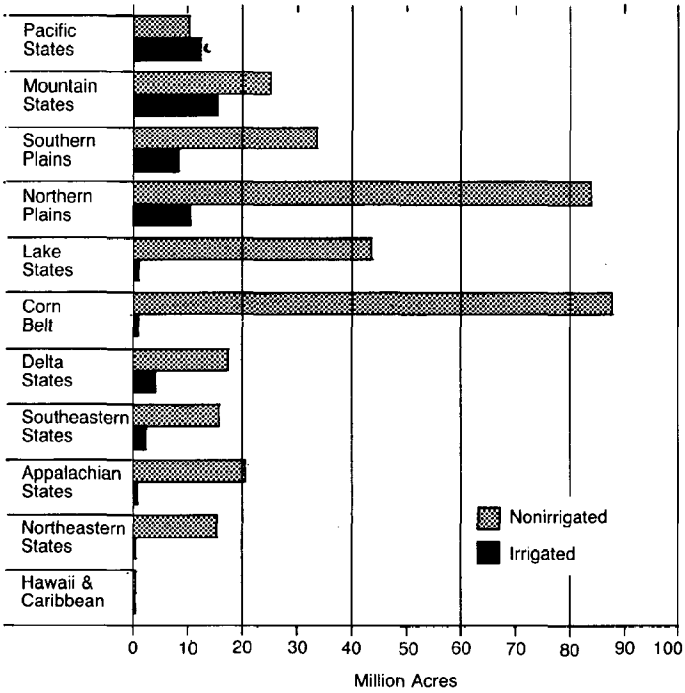

Figure 3-3.--Comparison of irrigated and nonirrigated cropland, by crop production region, 1977 (3).

Table 3-2 shows a nationwide summary of sheet, rill, and wind erosion on agricultural lands combined with total erosion on streambanks, gullies, roads and roadsides, and construction sites. The table shows that more than 140 million acres of cropland are losing more than 5 tons of soil per acre annually through combined water and wind erosion (3). Combined water and wind erosion exceeds tolerable levels for maintaining soil resources on almost 300 million acres of nonfederal cropland, pastureland, forest land, and rangeland.

The Nation's total water erosion is about 11 percent from streambanks, 6 percent attributable to gullies, 3 percent from roads and roadsides, and 2 percent from construction sites. The remaining 78 percent is sheet and rill erosion. The average annual rate of sheet and rill erosion on cropland in the conterminous United States is 4.7 tons per acre.

Table 3-3 and figure 3-4 show sheet and rill erosion on cropland by erosion rate. More than 77 percent of the Nation's cropland is eroding at 5 tons per acre annually or less; soil loss at this rate represents only about 27 percent of all cropland erosion. On more than 90 percent of the cropland, the annual erosion is 10 tons per acre or less; soil loss at this rate represents 46 percent of all cropland erosion and 11 percent of all excessive erosion. Therefore, it is on a relatively small acreage of cropland--the remaining 10 percent--that most cropland erosion occurs, some at rates of 100 tons per acre or more annually. Controlling the erosion on the most severely eroding 10 percent of the cropland would reduce total cropland erosion by 54 percent and excessive erosion on cropland by 89 percent. Even with such treatment, however, serious erosion problems would remain. Erosion would continue to gradually degrade extensive acreages of productive cropland now eroding less

Table 3-2.--Gross annual erosion on nonfederal land in the United States, 1977

Land use	Sheet, rill, and wind erosion on agricultural land				Total acreage in land use 1/	Total erosion
	<2 tons/ acre	2-5 tons/ acre	5-13.9 tons/ acre	14+ tons/ acre		
	(millions of acres)					(billions of tons)
Cropland	158.6	113.6	93.1	48.0	413.3	2.82
Pastureland	105.0	14.0	9.5	5.0	133.6	0.35
Forest land	327.0	26.0	11.7	4.9	369.7	0.44
Rangeland	283.5	55.5	40.1	28.8	407.9	1.71
Total sheet, rill, and wind erosion	---	---	---	---	---	5.32
Total erosion on streambanks, gullies, roads and roadsides, and construction sites	---	---	---	---	---	1.10
Total 1/	874.1	209.1	154.4	86.7	1,324.5	6.42

1/ Totals may not add because of rounding.
Source: 1977 National Resource Inventories (3).

Table 3-3.--Annual sheet and rill erosion on cropland and the amount of erosion in excess of 5 tons per acre, by erosion rate, 1977

Annual erosion rate	Total acres	Cumulative percentage of acreage	Total sheet and rill erosion	Cumulative percentage of erosion	Total erosion in excess of 5 tons per acre	Cumulative percentage of erosion in excess of 5 tons per acre
(tons per acre)	(millions)		(millions of tons)		(millions of tons)	
0-1---------	131.6	31.8	49.2	2.6	0.0	0.0
1-2---------	74.6	49.8	110.6	8.3	0.0	0.0
2-3---------	51.5	62.3	127.5	14.9	0.0	0.0
3-4---------	35.9	71.0	125.0	21.4	0.0	0.0
4-5---------	26.0	77.3	116.3	27.4	0.0	0.0
5-6---------	17.6	81.6	96.2	32.4	8.2	0.9
6-7---------	12.6	84.6	81.8	36.6	18.6	2.9
7-8---------	9.3	86.9	69.4	40.2	23.0	5.4
8-9---------	7.3	88.7	62.0	43.4	25.4	8.1
9-10--------	5.8	90.1	54.6	46.2	25.8	10.9
10-11-------	4.8	91.3	50.2	48.8	26.3	13.7
11-12-------	3.7	92.2	43.1	51.0	24.4	16.3
12-13-------	3.0	92.9	36.9	52.9	22.1	18.7
13-14-------	2.8	93.6	37.1	54.8	23.3	21.2
14-15-------	2.4	94.2	34.6	56.6	22.7	23.6
15-20-------	7.8	96.1	134.8	63.6	95.8	33.9
20-25-------	4.4	97.1	98.0	68.7	76.0	42.1
25-30-------	2.9	97.8	80.6	72.9	65.8	49.2
30-50-------	5.5	99.1	209.9	83.8	182.4	68.8
50-75-------	2.3	99.6	133.8	90.7	122.5	82.0
75-100------	0.8	99.8	64.4	94.0	60.6	88.5
100+--------	0.7	100.0	109.8	100.0	106.3	100.0
Total------	413.3		1,925.8		929.2	

Source: 1977 National Resource Inventories (3).

dramatically, but still seriously, at 5 to 10 tons per acre. Furthermore, conservation measures would need to be maintained on the cropland that is now adequately protected from erosion.

Erosion in key agricultural areas.--Sheet and rill erosion is a serious problem in many parts of the Nation, but it is especially so in key agricultural areas where erosion rates significantly exceed tolerable levels. Four examples of these special problem areas follow (1).

- The Corn Belt is one of the most productive agricultural areas in the world. Intensive cultivation of clean-tilled crops such as soybeans contributes to a serious erosion problem. About 37 percent of the cropland is eroding at annual rates of 5 tons per acre or more.

- The Palouse and Nez Perce Prairies and the Columbia Plateau in Washington, Oregon, and Idaho are major producers of dryfarmed legumes and small grains. The combination of steep slopes and seasonally intense rainfall have produced erosion rates of 50 to 100 tons annually.

- The Southern Mississippi Valley Silty Uplands in Kentucky, Tennessee, and Mississippi are used intensively for row crops. In many areas, annual soil losses exceed 20 tons per acre, and the rate of erosion on cropland over the entire area is nearly double the national average.

- Aroostook County, Maine, is one of the major potato-producing areas in the Nation. The intense cultivation normally used in growing this crop has reduced topsoil depth by 24 inches in some parts of the county, reducing crop yields and endangering the local economy.

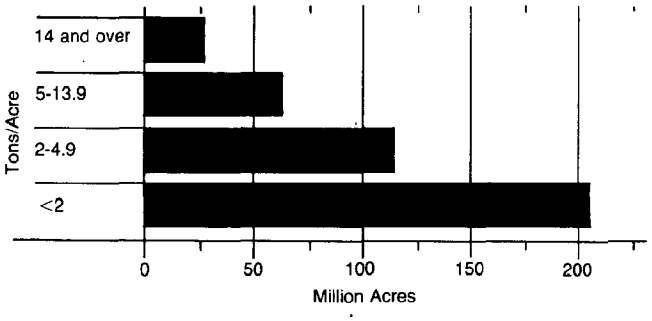

Figure 3-4.--Sheet and rill erosion on cropland in the United States, by erosion rate, 1977 (3).

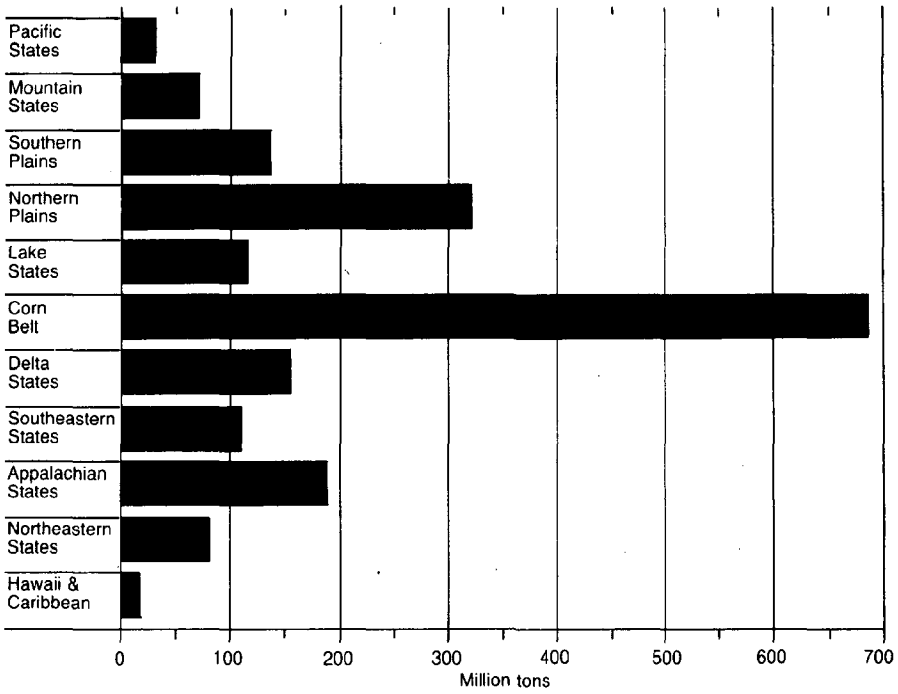

Figure 3-5.--Estimated total annual soil loss resulting from sheet and rill erosion on cropland, by crop production region, 1977 (3).

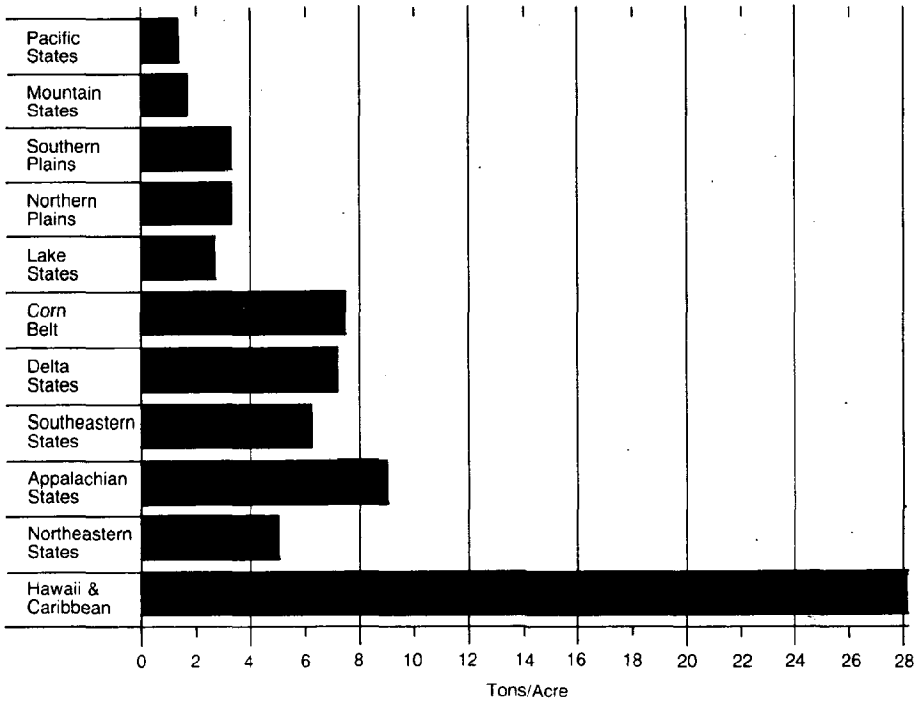

Figure 3-6.--Estimated average annual rate of sheet and rill erosion on cropland, by crop production region, 1977 (3).

Figures 3-5 and 3-6 show, respectively, estimated total annual sheet and rill erosion and average annual rate of sheet and rill erosion on cropland, by crop production region. The total amount of soil eroded from cropland in the Corn Belt is double that in any other region. The average rate of erosion on cropland in Hawaii and the Caribbean Area is triple that of any other region, but the average rate also exceeds 5 tons per acre in the Appalachian States, Corn Belt, Delta States, and Southeastern States.

Flood Damages

More than 175 million acres of nonfederal rural lands are subject to flooding. Nearly half of this acreage is in the southeastern United States. The Nation's flood-prone land is about 29 percent forest land, 28 percent rangeland, 20 percent cropland, 11 percent pastureland, and 12 percent other land (3). Twenty-one thousand communities experience flooding problems, including 6,000 with populations exceeding 2,500. In 1975, total flood damages in the United States exceeded $3.4 billion (table 3-4).

Water Conservation

Some water is lost in irrigation. The efficiency of irrigation systems averages 78 percent for delivering water to the farm and 53 percent for using water on the farm (5). Inefficient irrigation can degrade water quality, cause irrecoverable losses, waste energy used for pumping, reduce instream flows, and increase production costs. Return flows to streams from irrigated fields are important to downstream water rights and users.

Table 3-4.--Estimated flood damages, 1975

Kind of area	Upstream 1/	Downstream 2/	Total
	(millions of 1975 dollars)		
Agricultural	1,024	611	1,635
Urban and built-up areas	295	852	1,147
Other (rural utilities, roads, railways, homesteads, forest and grasslands, refuges, parks, etc.)	308	339	647
Total	1,627	1,802	3,429

1/ Upstream areas are adjacent to main streams and tributaries that drain a basin of 400 square miles or less.
2/ Downstream areas are all other areas of the river.
Source: Second National Water Assessment (6).

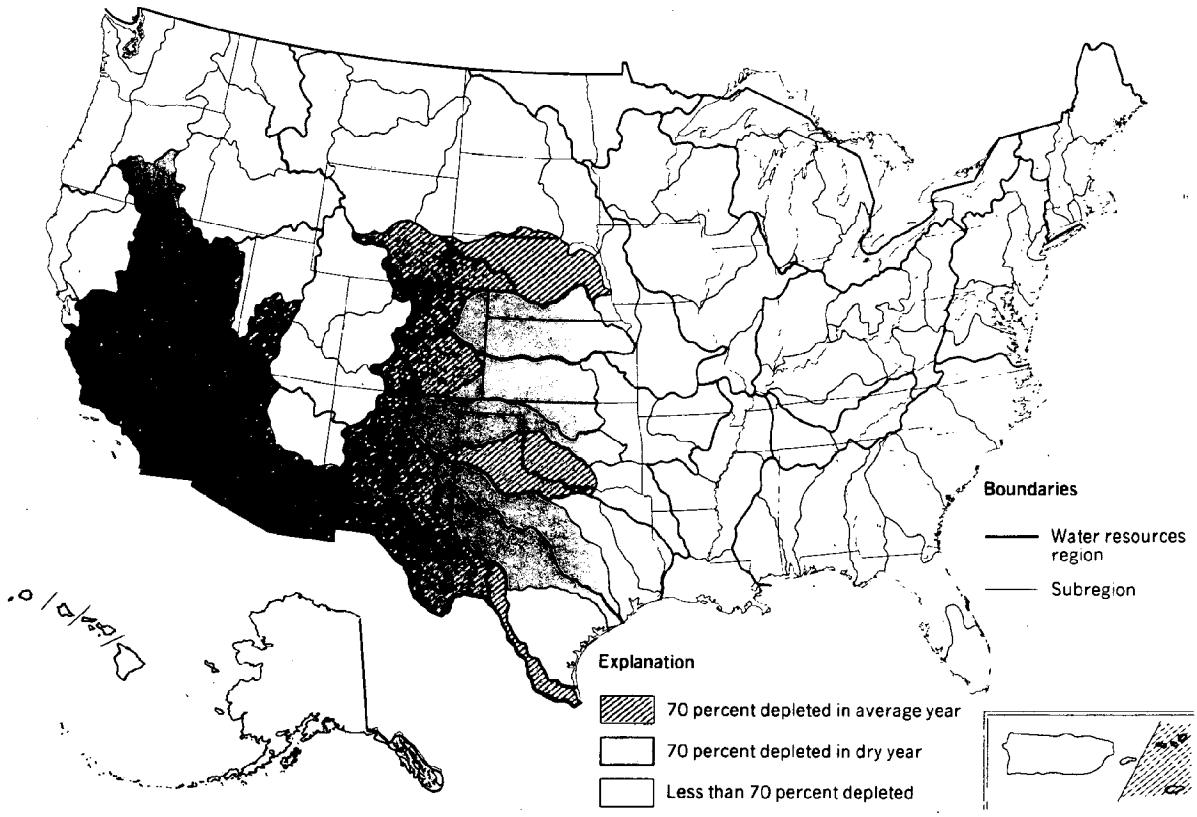

Figure 3-7.--Water depletion areas in the United States (7).

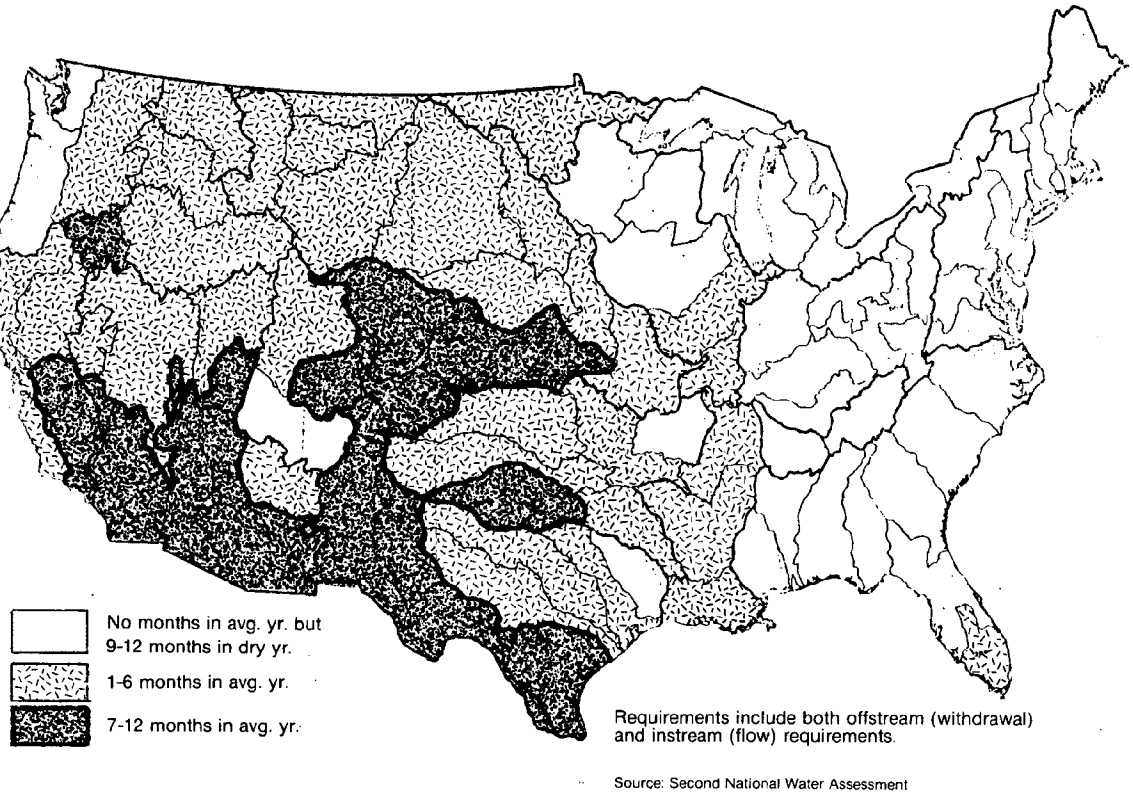

Figure 3-8.--Number of months that water requirements exceed supplies in the conterminous United States (7).

Nationwide, 5.4 percent of the replenishable water supply is consumed (depleted) annually. The percentage consumed in the humid regions is less than the national average, but in the arid regions this percentage is so high that it approaches the total replenishable supply. Figure 3-7 shows where the percentage of water consumed is very high or will be high before the turn of the century, if current trends continue.

Even in an average year, streamflow deficiencies occur in the Colorado, Rio Grande, and Great Basin regions. During dry years--an average of every 2 to 10 years when offstream requirements increase and flows are abnormally low--the instream supplies do not meet flow requirements. Figure 3-8 shows inadequate streamflow by subregion.

Water Quality

Bacteria, nutrients, dissolved solids (salinity), suspended solids (sediment), and toxic materials are the most common and most serious nonpoint source pollutants in the Nation's waters. Agriculture is the most widespread cause of nonpoint source pollution. This pollution comes mainly from runoff or irrigation return flow. Runoff generally increases the levels of bacteria, sediment, nutrients, and pesticides. Irrigation return flow generally increases the level of dissolved solids, nutrients, and pesticides.

Related Resources

Changes in farming practices have brought about changes in the American landscape. Fields have become larger and hedgerows have disappeared. In many areas, a single crop dominates the landscape. This increase in monocultural cropping patterns has been a major factor in reducing the diversity of wildlife habitat in many areas.

Runoff has carried agricultural chemicals and sediment into once-pure rivers and lakes. The degraded water in those areas can support much smaller numbers of fish and harm the animals that live near the streams.

The pressures to increase production have brought about the draining of thousands of acres of wetlands annually. These wetlands provide habitat for an incredible variety of wildlife species and serve as sediment and nutrient traps for the streams that flow into and through them.

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CHAPTER 4
FUTURE RESOURCE DEMANDS, CONDITIONS, AND PROBLEMS

The Soil and Water Resources Conservation Act of 1977 (RCA) requires the Secretary of Agriculture to project future demands and the potential impact that meeting those demands will have on the Nation's soil and water resources. These resources are under intense pressure to produce food and fiber for domestic consumption and export. At the same time, the Nation's future agricultural productive capacity is uncertain because of continuing damage from soil erosion, pollution, and flooding; conversion of farmland to other uses; and shortages of water. Degraded soil, water, and related resources reduce the quality of the environment and affect the standard of living in many areas of the country. This chapter summarizes the analyses of resource conditions. More detail is presented in Part II of the 1980 RCA Appraisal.

Assumptions and Projections

Projecting demands on the Nation's natural resources requires certain assumptions about future economic, social, and environmental trends. Historical trends are the result of major social, political, technological, and institutional forces that until recently did not change easily or quickly. Such patterns of stability, however, have been broken in the last decade, and new patterns have not yet been clearly established. In the absence of reliable new patterns, the assumptions and projections used in the appraisal are, for the most part, extrapolations of recent trends.

Domestic Population

Population growth directly affects demands for food and fiber, outdoor recreation, and water. It also influences the characteristics of the labor force, which is one of the major determinants of economic activity and use of materials. The 1980 RCA Appraisal used the Series II population projections of the United States Department of Commerce to estimate future demands for agricultural commodities (3) (table 4-1).

Gross National Product (GNP)

In recent decades, changes in the consumption of many resource products have been closely associated with changes in the Nation's GNP. Between 1940 and 1975, the GNP, measured in constant 1972 dollars, increased more than five times--rising at an average annual rate of about 3.7 percent. Annual changes have fluctuated widely, from +16.1 percent to -14.8 percent. Such factors as differences in the rates of change in the size of the labor force, unemployment, hours worked per year, and productivity will continue to cause fluctuations in the GNP. RCA analysts used the projections of GNP made by the Bureau of Economic Analysis, United States Department of Commerce. These projections show a GNP growth rate slowing from an annual increase of 3.6 percent in 1980-85 to an annual increase of 2.1 percent by 2030.

Table 4-1.--Population of the United States projected to 2030

Year	Series I 1/	Series II 2/	Series III 3/
	(millions of people)		
1976---------	215.2	215.2	215.2
2000---------	282.8	260.4	245.9
2020---------	354.1	290.1	253.0
2030---------	392.8	300.3	249.3

1/ Annual growth rate ranges from 1.0 to 1.3 percent.
2/ Growth rate increases to 0.9 percent in the 1980's, then declines to 0.6 percent by 2000 and to 0.3 percent by 2030.
3/ Annual growth rate drops to 0.3 percent by 2000. By 2030, there will be a slight decline in population.
Source: U.S. Department of Commerce (3).

Table 4-2.--Projections of annual domestic per-capita consumption of selected commodities

Commodity	1975-77 average	2000	2030
		(pounds)	
Wheat----------	153	158	173
Rice----------	10.5	14.2	15.3
Corn----------	83	126	140
Peanuts----------	8.6	11.0	11.4
Cotton----------	16.1	14.0	13.4
Sugar----------	100	95	94
Citrus fruit----------	116	139	145
Noncitrus fruit----------	102	109	115
Vegetables and melons----------	246	273	290
Irish potatoes----------	120	134	140
Dry beans and peas----------	6.6	5.3	4.3
Beef and veal----------	129	140	152
Pork----------	59	70	74
Lamb----------	1.9	1.4	1.2
Chicken----------	43	65	58
Turkey----------	9.0	11.7	13.9
Eggs----------	36	33	30
Milk----------	549	529	493

Source: Economic Research Service.

Following long-established trends, transportation, trade, and other services will account for a slowly growing share of the total GNP. The United States will, however, continue to produce huge quantities of physical goods, which means that large supplies of energy, minerals, and other raw materials will be needed.

Disposable personal income--income available for spending or saving--is an important determinant of demand. Since 1929, disposable personal income has equaled about 70 percent of the GNP. The RCA analysts assumed that this fairly constant relationship will continue for the next 50 years.

Demand for Agricultural Products

RCA projections of demands for agricultural products are based on the 1979 OBERS Program Report (4). 1/ The OBERS series projects economic activity for the Nation, individual states, and economic and hydrologic areas. It includes projections of population, personal income, employment, and earnings by individuals and industry. The agricultural projections include agricultural land use and commodity production and value. Domestic and foreign demands are built into the projections. The projections were extended to the year 2030 for use in RCA analyses.

Domestic demand.--As consumer incomes increase, the demand for beef and veal, chicken, turkey, and vegetables tends to increase and the demand for eggs, milk, dry beans and peas, and cereal products tends to decrease (table 4-2). Per-capita food consumption increased about 5 percent from 1967 to 1980. Because of population growth, however, total food consumption increased by nearly 20 percent (fig. 4-1).

Export demand.--The projections of export demand that ERS developed for RCA assume a 2.3 percent annual increase in exports until the year 2000 and a 0.6 percent annual increase from 2000 to 2030. The growth rate from 1976 to 2000 reflects a continued expansion of international markets for feed grains to meet the needs of expanding livestock industries in developed countries and for good grains in many countries as those countries seek to upgrade the diets of their people.

The projection that the rate of growth in exports will be slower from 2000 to 2030 is based on the assumption that meeting expanding export markets will result in higher production costs. Higher commodity prices are expected to dampen the rate of growth of international demand for American agricultural exports.

The export projections are considered "moderate." They are based on the assumption that countries will continue their existing import policies. Changes in the food production and import policies of importing countries could significantly affect the level of projected American agricultural exports.

1/ The OBERS series is a major product of a program of economic measurement, analysis, and projection conducted by the Bureau of Economic Analysis (BEA), formerly the Office of Business Economics (OBE), of the U.S. Department of Commerce, and the Economic Research Service (ERS) of the U.S. Department of Agriculture (USDA). The program acquired the acronym "OBERS," signifying a united effort of OBE and ERS.

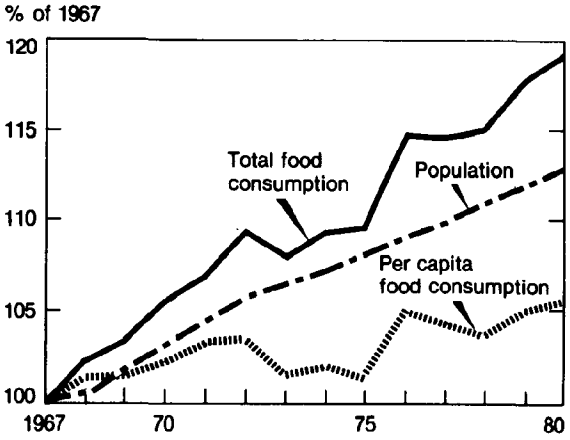

Figure 4-1.--Index of population and food consumption. Total food consumption based on retail weight using constant retail prices as index weights. Civilian population on July 1, 1980, for 50 states.

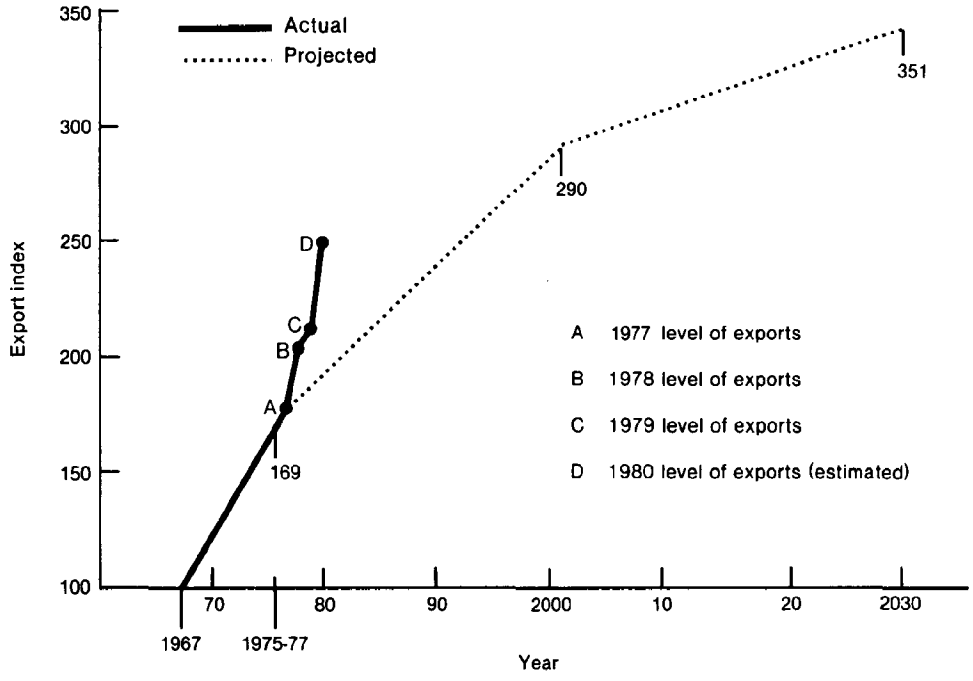

Figure 4-2.--Projected and actual exports, 1967-2030.

Figure 4-2 shows projected export trends through 2030. Actual exports since 1977 have been significantly higher than the projections. If growth in export levels continues to follow the pattern of the last three years, the RCA projections will be low. Therefore, the pressure of foreign demands on the soil and water resources in the United States could be greater than expected, especially in the next decade or so.

Agricultural Prices

For RCA projections, the United States Department of Agriculture (USDA) used normalized prices (5) to estimate the gross value of agricultural production. However, to evaluate the economic consequences of alternative conservation programs, it estimated commodity prices to reflect the cost of producing the last unit of output demanded by the market.

Technological Growth

Technological growth is one of the main factors influencing the capability of American agriculture. It can have a major impact on the intensity of production methods that farmers use and on the corresponding need for conservation practices to maintain soil productivity and to minimize damage to the environment. Over the past 50 years, improvements in technology have caused agricultural productivity to grow at an average rate of 1.6 percent annually. Because the rate of productivity growth has been slowing in recent years, RCA analysts assumed an average annual growth rate of 1.1 percent. They also analyzed the effect of investments for research and extension activities that would maintain the historic rate of 1.6 percent and the effect of a decline in real investments for research and extension that would result in a rate of growth of 0.6 percent.

Resource Problem Analyses and Findings

Soil Resources

Growing demands for food and fiber caused large acreages of land to be brought into crop production during the 1970's. Table 4-3 shows that acreages planted to crops (excluding very minor crops) increased from nearly 299 million acres in 1969 to about 364 million acres in 1980. Over two-thirds of this increase occurred in the Appalachian, Corn Belt, Lake States, and Northern Plains regions. Row crops increased by 49.7 million acres; about 79 percent of this increase occurred in these same four regions. The acreage in wheat increased nationally by 27 million acres; more than half of this increase occurred in the Northern Plains and Southern Plains. With the exception of rice, acreages of other close-grown crops declined. The harvested acreage of hay remained stable.

Much of the increase in the acreage of cultivated crops occurred in regions identified in chapter 3 as having high average per-acre rates of sheet and rill or wind erosion (see fig. 3-6). Most of the increased acreage of culti-

Table 4-3.--Planted acreage of crops, by crop production region, 1969, 1974, 1980

Region	1969			1974			1980		
	Total row crops 1/	Total non-row crops 2/	Total crops	Total row crops	Total non-row crops	Total crops	Total row crops	Total non-row crops	Total crops
	(thousands of acres)								
Northeast	3,975	8,075	12,024	5,006	7,858	12,864	5,690	7,869	13,379
Appalachian	8,896	6,753	15,649	11,153	5,868	18,011	13,908	7,257	21,165
Southeast	8,192	2,631	10,823	9,647	2,828	12,475	11,912	3,681	15,593
Delta	12,376	2,487	15,963	12,746	3,931	16,677	15,543	5,298	20,842
Southern Plains	16,313	17,290	33,603	16,294	19,660	35,954	16,934	21,160	38,094
Corn Belt	53,791	19,258	73,049	64,650	18,630	83,280	71,641	17,819	89,460
Lake States	14,506	16,754	31,260	21,260	17,127	36,424	22,704	16,991	39,695
Northern Plains	21,437	47,283	68,720	21,154	51,701	76,855	29,672	52,533	82,205
Mountain	3,992	20,851	24,843	3,976	22,153	26,129	4,368	23,755	28,123
Pacific	2,325	10,662	12,987	2,792	11,596	14,388	3,105	12,070	15,175
Total	145,805	153,118	298,923	170,716	162,342	333,058	195,477	168,253	363,730

1/ Includes planted acreage of corn, sorghum, soybeans, flaxseed, peanuts, sunflowers, cotton, dry beans, sugar beets, potatoes, and harvested acreage of tobacco.

2/ Includes planted acreage of oats, barley, wheat, rice, rye, and harvested acreage of hay.

Source: Economic Research Service.

vated crops was planted to soybeans. Land on which soybeans are planted is generally clean tilled and thus more susceptible to erosion. Furthermore, these newly planted crop acreages previously were in other crops or in noncrop uses that probably were less erosive. These other uses include diverted lands under government programs, temporarily idle cropland, cropland temporarily in pasture, permanent pastureland, rangeland, and idle forest land.

Erosion.--Studies have shown that the short-term private economic incentives for soil conservation are weak (1). Two general characteristics of soil erosion control investments may contribute to slow recent progress in reducing excessive erosion. (1) Because erosion occurs slowly, its long-term effects are in many cases not apparent to a land owner or operator. Moreover, on many soils improvements in technology permit yields to increase despite the soil loss. It is therefore difficult for some land owners or operators to perceive erosion as a serious short-term problem until costs increase or yields decline. (2) Returns to land owners and operators from many erosion control investments accrue slowly over long periods of time. A large portion of these investments may not be recovered within the relatively short time in which most operators evaluate their investments. Furthermore, some of the short-term benefits accrue to other land owners, resource users, and the general public rather than to the land owners and operators who apply the practices and bear the costs.

For the National Agricultural Lands Study (NALS), estimates of productivity loss caused by erosion were made in terms of "acre-equivalents" of cropland (2). Based on the NALS estimate of 1.01 billion tons of sheet and rill erosion in excess of 5 tons per acre per year, the Nation is losing the equivalent of 1.01 million acres of cropland annually to erosion. Wind erosion in the 10 Great Plains states results in the loss of an additional 240,000 acre-equivalents. If the 1977 rate of wind and water erosion continued over the next 50 years, up to 62 million acre-equivalents of productive capacity could be lost. Using a computer model and a different set of assumptions, USDA calculated that up to 32 million acre-equivalents could be lost by the year 2030 as a result of sheet and rill erosion alone.

These estimates are based on existing information on the relationship between soil erosion and soil productivity. The available data, however, are not reliable enough to provide accurate estimates of such relationships. The RCA Appraisal indicated that high priority should be given to expanded research to better quantify the relationship between soil erosion and soil productivity.

Much of the analysis for determining the potential for reducing excessive erosion was done through a linear programming model at the Center for Agricultural and Rural Development (CARD) at Iowa State University. The findings varied according to changes in the basic constraints placed upon the model.

In the base analysis, the model selected activities, including conservation treatment, that minimized the cost of crop production if offsite benefits were assigned no value and if farmers were assumed to plan for returns over 50 years. In the model, the most cost-efficient combination (under these assumptions) of crop rotation, cropland use, and conservation treatments resulted in about 1.3 million tons of sheet and rill erosion from cropland in 2030.

The CARD model indicates that, under the assumptions given, total erosion could be reduced 40 percent below the amount projected in the base analysis without significantly increasing the cost of food and fiber production. Total costs for conservation practices would increase as additional efforts were made to reduce erosion. A 40-percent reduction in erosion would mean that the annual erosion rate on nearly 98 percent of the cropland would be less than 5 tons per acre (the average rate would be 2.1 tons per acre). Erosion control practices would maintain crop yields and thus in the long run increase the incomes of farmers who operated erodible land. The total cost of producing food and fiber, however, would remain about the same because of the additional costs associated with controlling erosion.

Availability of cropland.--The CARD model was also used to test the influence of land availability on future crop production costs. The following assumptions were made for this analysis: (1) the 413 million acres of cropland identified in the 1977 National Resource Inventories (NRI) were the initial base; (2) 44 million acres of this cropland would be irreversibly lost to urban, transportation, and similar uses by 2030; (3) agricultural productivity would increase by 1.1 percent annually as a result of improvements in technology; (4) total production would be less than the maximum possible; and (5) additional land would be available for conversion to cropland. The analysts compared the model's results for two potential cropland acreages: the 127 million acres of potential cropland identified in the 1977 NRI and the 25 million acres of wet soils having high potential for conversion.

Using the 25-million-acre limitation, the model projects that food and fiber costs (in constant dollars) for the average consumer would be about 170 percent of the 1977 unit costs. Using the entire 127 million acres of high and medium potential cropland, however, the model projects that food and fiber production costs could drop to about 77 percent of current costs (in constant dollars).

If erosion were reduced by 40 percent and all 127 million acres of potential cropland were brought into production, the following impacts would likely occur: (1) the average cost of producing food and fiber would not change significantly, (2) pesticide use would increase, (3) some of the erosion reduction would be accomplished because some production would be shifted to less erodible soils or to different regions; (4) fewer practices, including minimum tillage, would be needed to protect future productivity than would be needed if only 25 million acres were available for conversion; and (5) costs of conservation practices for erosion control would be lower than if only 25 million acres of potential cropland were converted.

Changes in the growth rate of technology.--The rate of increase in crop yields as a result of changes in technology is one of the most important factors considered in the analyses. Three separate estimates were tested: a yield increase of about 0.6 percent per year, one of about 1.1 percent, and one of about 1.6 percent. Using the 0.6 percent annual increase, the CARD model projects that not enough land would be available to meet production needs in 2030. The Nation would find it impossible to meet projected export and domestic demands at a reasonable cost.

Using the projected 1.6 percent annual increase in technological growth, the model projects that food costs would remain relatively stable and that very

little of today's potential cropland would be needed to produce enough food and fiber to meet projected domestic demands and the moderate projected level of exports. This land could be available for other uses, such as producing biomass (for energy production), other crops for a larger export market, forage, or timber.

An effective research program that permitted a growth of 1.6 percent annually in crop yields would offer more options regarding land use, total crop production, and level of exports. A smaller rate of growth in productivity reduces the range of options and places greater emphasis on policies to retain prime agricultural lands for cultivation, at least for the next 50 years.

Impact of higher energy costs.--Analyses were conducted to evaluate the potential impact of increasing energy costs for alternative demand levels. These analyses show that major effects of energy price increases would be to reduce the amount of land irrigated with pumped water, increase the use of conservation or minimum tillage, and increase the unit cost of producing food and fiber.

Upstream Flood Damages

About 175 million acres of flood plains on nonfederal rural lands in the conterminous United States are subject to flooding from a 100-year storm. About 16 percent of the Nation's prime farmland is on flood plains. Flood damages in 1975 to crops, pasture, urban property, and other properties such as roads, bridges, and utilities were more than $1.7 billion (in 1975 dollars).

Projected total damages for the year 2000 are $2.3 billion. Ninety-eight percent of the increase is expected to result from damage to urban and other properties. The projections are based on two assumptions: (1) flood plain regulations will be implemented at a rate faster than the current rate but not at the maximum practical level, and (2) structural measures will be installed at a slower rate than in the recent past.

The estimated damages to crops and pasture in 1975 were $1.1 billion. This is about 4.8 percent of the estimated 1975 net agricultural income for the Nation. This percentage would decline by 2000 as a result of expected increases in total agricultural production and farm income, assuming that the structural approach to flood control is continuous. Agricultural losses, however, are projected to increase slightly (2 percent) from 1975 to 2000.

Urban and other damages are expected to increase by 83 and 86 percent, respectively, by the year 2000. The increases are attributed to the continued development of flood-prone lands.

Floods killed 3,738 people between 1925 and 1970. Actuarial estimates show the general trend to be downward. This can, in part, be attributed to improved flood-warning and flood-forecasting efforts, which are being continued and improved.

Complete elimination of flood damages is not practical, but studies indicate that losses could be reduced as much as 35 percent over 20 years by use of measures other than structural (6).

It is very difficult to justify structural measures on the basis of agricultural benefits alone. Agricultural damages on less intensively used areas of the flood plain are not expected to be substantially reduced by nonstructural alternatives. Changing from crops such as corn, soybeans, or other high-value crops to pasture or woodland normally involves a loss in net farm income even where the higher value crop has been damaged by floods.

Land use and construction controls could be more effective in slowing the rate of increase of losses in urban areas. States, counties, and cities, however, will have to enforce regulations and ordinances if flood losses are to be kept from exceeding projected levels. Equitable arrangements need to be instituted for social acceptance.

The environmental impact of flood control measures has to be assessed on a project-by-project basis. The adverse environmental effects of nonstructural measures will usually be less than those of structural measures. The latter often involve environmental impacts related to the size of the area disturbed or inundated by a reservoir and the location of the project.

Water Quality

Pollution from nonpoint sources is receiving wider attention as point sources are gradually brought under control. Nonpoint source pollutants are generally diffused and may be more readily assimilated by the receiving waters than are the more concentrated pollutants from point sources. Because nonpoint source pollutants are generally released as pulse loads during rainfall, violations of water quality standards may be intermittent rather than continuous and therefore difficult to identify and quantify. The agricultural nonpoint source pollutants analyzed in the RCA process are sediment, dissolved solids (salinity), organic (animal) wastes, nutrients, and toxics.

Sediment.--Erosion and sedimentation are natural processes that can be accelerated by man's activities. Fine-grained particles of soil and organic matter are highly susceptible to erosion and may transport pesticides and nutrients to surface water. About 760 million tons of sediment annually reach surface waters from cropland, according to analyses based on the National Water Quality Model developed by Resources for the Future. This represents about half of all sediment that reaches streams and lakes. Conservation practices that reduce soil erosion and therefore sedimentation improve water quality. Most of the nonpoint source sediment control needed to achieve the objectives established by Congress for improving water quality can be accomplished through agricultural land management and conservation systems that reduce cropland erosion and protect the long-term productivity of the soil.

Dissolved solids (salinity).--Increased salinity of return flows from irrigated lands is the most significant water quality problem associated with agricultural irrigation. Other pollutants--such as pesticides, nutrients, and sediment--from irrigated lands also degrade water quality. Erosion of soils with high salt content produces a part of the 90 to 100 million tons of salt that annually degrade water supplies in the western states.

Organic (animal) wastes.--Analysis of organic waste management was limited to livestock wastes produced on animal feeding operations of less than 300 animal units. Of the 718,000 operating units with less than 300 animal units, 25 percent have a potential to produce runoff that can degrade water quality. Land disposal of industrial and municipal wastes is becoming an agricultural concern as a result of the increasing use of these wastes as fertilizer. Crop residues can also be sources of water pollution.

Nutrients.--Agricultural nitrogen and phosphorus can enter surface and ground water in runoff and sediment and through leaching losses. These nutrients originate in animal wastes from confined feeding operations, wastes disposed of on land, fertilizer, and crop residues. The total amount of nitrogen and phosphorus that reaches surface and ground water depends upon fertilizer application rates, soil properties, terrain, crop management practices, and rainfall. It is estimated that 15 to 54 percent of the total applied nutrients reach surface waters. The amount of nitrogen reaching surface water ranges from 0.03 pound to 8.4 pounds per acre, and the amount of phosphorus, from 0.01 to 0.08 pound per acre.

Toxics.--In 1977, over 200 million acres of land were treated with herbicides, 75 million acres with insecticides, and 8 million acres with fungicides. Farmers used approximately 60 percent of the 1.5 billion pounds of pesticides manufactured in the United States in 1977. Projections of current trends indicate that farmers are likely to use 3.8 billion pounds of pesticides annually by 2030.

Many investigations have found various agricultural pesticides in runoff from treated lands. Nearly all investigations indicate that concentrations are very low and that less than 5 percent of the application reaches surface water unless heavy rainfall occurs directly after treatment. Some chemicals, however, are so highly toxic to fish or other aquatic forms and can persist for such a long time that even very low levels are a cause for concern.

Critical problem areas.--Figure 4-3 is a composite map that shows where one or more agricultural nonpoint source pollutants are likely to degrade water quality.

Water Supply and Conservation

Total demands for water are projected to continue to rise in the future. The use of water for manufacturing, mining, and generating electricity is expected to increase much more rapidly than the use of water for agriculture. The increase in total demand for water will intensify competition where supplies are limited. RCA Appraisal findings include:

- Irrigation accounts for 47 percent of the fresh water diverted or withdrawn and 81 percent of all water consumed in the United States.

- The average off-farm irrigation conveyance efficiency for the 17 western states is estimated to be 78 percent and the average onfarm efficiency is 53 percent. It is well within existing technical capability to increase these efficiencies to much higher levels. Improvements in efficiency could reduce net depletions by 1.1 million acre-feet

annually. Existing institutional and social factors that affect irrigation efficiencies include interpretation and administration of water laws and court decrees--such as "beneficial use," allocation for instream flows, change in use, and conjunctive use--and substitution of water where it is relatively cheap or free for labor and capital investment.

- Irrigated acreage is expected to increase in the future, though at a moderate rate. Increasing production through irrigation reduces the need to cultivate additional croplands. New irrigation can be expected on at least 13 million acres by the year 2030. Much of it will be based on previously unexploited ground water in the eastern part of the 17 western states. Withdrawing additional ground water will decrease instream flows and associated values in some areas. A careful comprehensive assessment is needed of how the location of agricultural production can be optimized in relation to future distribution of available water supplies for irrigation and the productivity potentials of agricultural land and water resources.

- As ground water mining continues, the falling water table and increased energy costs will make water uneconomical to pump in some areas. Rising costs of labor and energy will cause some increases in the efficiency of water use--and in some places discontinuation of irrigation--where water must be pumped. Ground water is the water source for 32 percent of the irrigated acreage in the 17 western states. Nearly half of the ground water used in irrigation is mined.

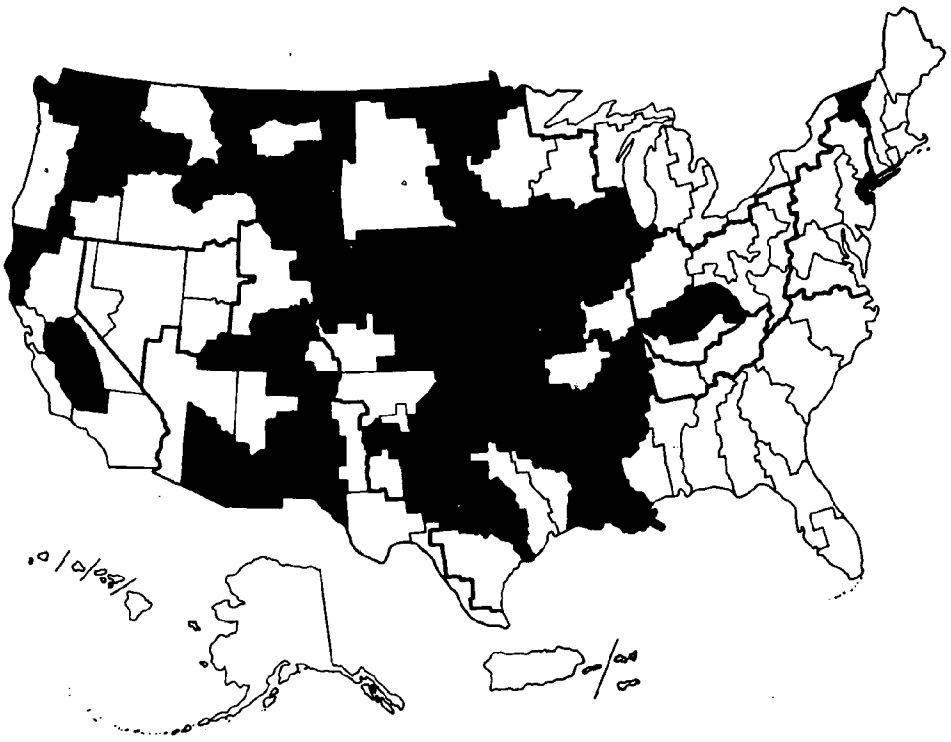

Figure 4-3.--Areas where potential for degradation of water quality is high because of agricultural nonpoint source pollutants.

- o Deficient soil moisture limits production on nonirrigated cropland in the semiarid Great Plains. Improved management to directly modify either the infiltration rate or evapotranspiration rate would maintain higher soil moisture levels and enhance production.

- o In areas where water losses from irrigation systems result in artificial wetland values, management improvements that eliminate or reduce this water loss will lower the quality of the wetlands as wildlife habitat.

Urban and Community Resource Conservation and Development

Proper site selection and use of erosion control measures can reduce erosion and sedimentation problems on construction sites. Urban areas contribute 4 percent of the nonpoint source sediment in the Nation's waters. In 1978, water erosion removed nearly 80 million tons of soil from construction sites and 169 million tons from roads and roadsides. Up to 90 percent of the soil erosion in urban areas takes place on land under development.

Soil stability problems are significant in urban communities and developed areas in nearly every state. Cracked foundations, disrupted utilities, and damaged roads, bridges, and other structures all indicate soil stability problems. Nationwide, about 28 million acres of urban land are on wet soils. Problems resulting from development on wet soils include wet basements, ineffective septic systems, poor conditions for lawns and gardens, and high maintenance costs for driveways and streets. An estimated 875,000 acres of wet soils, including 175,000 acres of wetlands, are converted to urban uses annually. Urban communities can reduce the growth of such problems by more effective development planning to avoid wet soils.

Urban areas and rural transportation land occupy about 94 million acres in the United States. Nearly 3 million acres of rural land are converted to built-up uses annually, including nearly 1 million acres of prime farmland and 875,000 acres of soils that have drainage problems or are susceptible to flooding. Land used for urban areas is projected to increase to about 179 million acres by 2030, about double the current area.

Fish and Wildlife Habitat

Wetlands.--Shallow lakes and wetlands are highly productive wildlife habitat. Marshes compare favorably with the best managed terrestrial systems in terms of the primary production of plants. Between 1954 and 1977, the acreage of wetlands in the United States declined from 82 million acres to 70.5 million acres, an average annual loss of about 500,000 acres.

In the last decade, USDA programs have directly provided for the protection of 23,000 acres of wetlands per year. By the end of 1981, the total acreage protected is expected to be slightly less than 230,000 acres and will remain at that level. In addition, the owners of about 550,000 acres of wetlands annually receive technical assistance that is directed to maintenance and management of the wetlands. It is estimated that 15.1 million acres of wetlands will need to be converted to cropland to meet projected demands for food and fiber in the most economical manner. Setasides are not effective in

deterring conversion of wetlands to crop production in the face of rising demands for food and fiber.

Terrestrial wildlife habitat.--Some land uses, such as urban development, are mostly incompatible with wildlife habitat, whereas others, such as agriculture, may be complementary. Nonetheless, although wildlife may be able to use agricultural land, the primary land use (agriculture) will determine the land's effectiveness for the secondary land use (wildlife habitat).

o Cropland wildlife habitat.--Agricultural technology enables farmers to increase crop production while farming fewer acres more intensively. The extent of hedgerows, field borders, grassy areas, woodlots, and other vegetation that provides diverse wildlife habitat near cropland has been reduced. In 1977, residue was being removed from over 50 percent of the cropland and vegetative diversity was low. Analyses of available data show that the quality of wildlife habitat on cropland was at just above one-third of potential.

o Rangeland wildlife habitat.--The quality of wildlife habitat on rangeland is influenced by the primary land management system. Poor condition rangeland provides poor quality grazing for livestock and provides poor habitat for range wildlife. The available data indicate that the quality of rangeland habitat was at about one-third of potential in 1977.

o Forest wildlife habitat.--The quality of wildlife habitat on forest land is being reduced in some areas, primarily through grazing by domestic livestock or grazing of forest types where livestock should be excluded. The estimated quality of wildlife habitat on forest land is about two-thirds of potential.

Energy Conservation and Production

Some activities to conserve soil and water resources result in direct energy savings or increase production per unit of energy used. The production of biomass and other energy forms from agricultural land, however, could lead to increased soil erosion and other forms of soil degradation, particularly between 2000 and 2030.

Under current technology, ethanol production from grain crops has the most potential for the production of energy. Intensive production of ethanol from grain could result in changes in crops and cropping systems. It could also result in cultivation of additional lands, some of which are likely to be fragile and subject to erosion. Furthermore, the starch-producing crops most feasible for ethanol production are row crops and thus are usually associated with soil erosion problems.

The Energy Security Act of 1980 established a goal for agriculture to produce an amount of alcohol equal to 10 percent of the Nation's annual gasoline consumption by 1990. Twenty-eight million acres would have to be cultivated for biomass crops to meet this goal (assuming an average yield of 300 gallons of alcohol per acre from improved crop varieties). Distillers dry the grain residues that remain after ethanol production. These residues could be substituted for soybeans in livestock feeds, thereby reducing the acreage of soybeans by 12.9 million acres. Thus, the net additional acreage needed by 1990 for cultivated biomass crops would be 15.6 million acres.

Organic Waste Management

Modern agriculture produces great quantities of organic waste. Included are over 430 million tons of crop residues and 175 million tons of animal wastes annually. Ninety percent of the animal wastes and 68 percent of the crop residues are presently used to improve soil tilth and fertility. Current management, however, results in the loss of a substantial part of the benefits of these resources.

About 1 million tons of urban organic wastes, such as sewage, septage, and refuse, are presently used in agriculture. An additional 2 million tons could be used to help improve soil tilth and fertility and decrease the cost of disposal. These amounts, however, are relatively small compared to farm-generated wastes.

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CHAPTER 5
EFFECTIVENESS OF PRESENT PROGRAMS

The principal soil and water conservation programs of the United States Department of Agriculture (USDA) were begun in the mid-1930's. They were established in the crisis atmosphere of the Great Depression. The droughts and severe dust storms of that period coupled with a vigorous crusade against soil erosion made people across the Nation aware of the need for soil and water conservation and generated widespread support for the new programs. There was little question of the need for federal action and little emphasis on monitoring the progress of the new programs.

Basic information about the magnitude of soil erosion and related problems was limited when the Soil Erosion Service was established in the Department of the Interior in 1933. One of the first activities carried out by that agency was the Reconnaissance Erosion Survey of 1934. Although completed in only a few months and later criticized as being somewhat superficial, this survey provided the first estimates of the severity of erosion problems throughout the country and portrayed vividly how much work needed to be done.

The next national study of soil and water problems was the USDA Conservation Needs Inventory (CNI) of 1958 (6). This inventory was led by the Soil Conservation Service (SCS), the successor to the Soil Erosion Service. The 1958 inventory was the first to use statistical sampling techniques. It provided considerable detail, down to the county level, on land use, land capability, and conservation treatment needs. The information could not be compared directly with erosion conditions as reported in the 1934 survey. The difficulty in using the 1958 CNI was described by Held and Clawson:

> They [the CNI data] do not give any hint as to whether erosion is caused primarily by wind or water, and they provide no direct information as to the trend in erosion in the past. The Inventory is not an objective measurement and presentation of the facts about the soil erosion which existed then and its trends, but is primarily the conclusions of the U.S. Department of Agriculture (and mainly of SCS) or its interpretations of facts which have not been published in a form permitting others to test these conclusions or to make other analyses. (5)

The lack of data made it difficult to gauge conservation progress from 1934 to 1958. A second Conservation Needs Inventory, conducted in 1967, used essentially the same procedures as the 1958 inventory (7). Thus, it was similarly lacking in details about the extent and severity of erosion and other conservation problems and changes over time.

The 1977 National Resource Inventories, conducted by SCS, were designed to overcome the shortcomings of the two previous inventories. These inventories provided the first nationally consistent and statistically reliable estimates of current erosion rates. Data from these inventories were reported in the 1980 RCA Appraisal Part I (14) and provided the basis for much of the analysis

displayed in RCA Appraisal Part II (15). These data and other information in the Appraisal provide some insights into the effectiveness of present programs.

Findings of the RCA Appraisal

There appears to be a broad consensus that soil conservation programs and practices have reduced and continue to reduce erosion from agricultural lands. National surveys indicate, however, that progress in controlling erosion has been slow. There is evidence that total soil erosion actually increased during the 1970's because the acreage of row crops increased substantially in response to growing world demands and favorable prices for agricultural commodities. Survey data for 1967 and 1977 show that soil losses on cropland increased from 2.6 billion tons in 1967 to 2.8 billion tons in 1977 (7, 24).

The extent of serious erosion and other resource problems is evidence that present programs with their historical funding and personnel levels have not been fully successful. For example, the annual erosion rate exceeds 5 tons per acre on nearly one-fourth of the Nation's cropland. 1/ In the Southeast, over 40 percent of the cropland is eroding at excessive rates. Despite such statistics, millions of acres of land have received conservation treatment as a result of past and present USDA programs (11). Much of the erosion of the 1930's has been healed, but new problems have arisen due to several factors. These include changes in farming enterprises and production practices brought about by changes in crop prices, farm machinery, and new technologies; changes in farm ownership; and conversion of grasslands and forest lands to cropland. While USDA agencies can report substantial improvements in natural resource conditions on some individual farms and ranches over the years, serious national problems still exist.

Findings of Audits and Evaluations

A number of studies have been conducted over the years to determine the effectiveness of ongoing conservation programs. These have included audits by the General Accounting Office (GAO) as well as audits and evaluations by various USDA agencies and outside organizations and individuals.

Many such reports are outdated. They describe natural resource conditions and program policies that are no longer current. Not all programs have been fully evaluated, even though some case studies of a particular program's activities have been completed. For example, no comprehensive analyses have been conducted of USDA activities dealing with flood protection, urban conservation, or water quality. Nevertheless, a number of recent reports give valuable insights into the performance of individual conservation programs.

1/ Erosion at an annual rate of 5 tons per acre or less is generally considered tolerable, although the actual rate varies from one soil to another. Erosion at this tolerable rate does not reduce the long-term productivity of the soil. When erosion exceeds the tolerable rate, soil is lost faster than natural soil-building processes can replace it.

Program effectiveness was studied by the USDA Land and Water Conservation Task Force, which was established in 1977 in response to a request from the Senate Committee on Agriculture, Nutrition, and Forestry. The task force reviewed all available audits and evaluations of USDA conservation programs. It found some useful analyses on individual programs but nothing that encompassed the combined effects of two or more programs (11). The task force reported the following conclusions regarding program reviews:

- Most program reviews gave less attention to program accomplishments and benefits than to program costs, number of people employed, and other general information.

- Quantification and description of program benefits to the ultimate recipient are poor to nonexistent in most reports.

- No reviews were found that follow program effects through time to discover how long the effects last or what benefit is derived.

In spite of the limitations noted above, audits and evaluations have been useful in monitoring program performance and guiding program management. The most recent studies are summarized below. Agency actions taken as a result of the findings are indicated where appropriate.

Conservation Technical Assistance Program

Conservation Technical Assistance is conducted by SCS under the authority of P.L. 74-46 (49 Statute 163, 16 U.S.C., 590 a-f). The core program of SCS, it provides direct technical assistance to land owners and operators in nearly 3,000 conservation districts. Assistance is provided for onsite planning and application of conservation treatment to meet the needs of the land user. Two major reviews of this program have been conducted.

In December 1975, the SCS Administrator established a task force to study the adequacy of conservation systems on cropland. The task force included SCS staff members from national, state, and field levels. Their principal focus was the impact of current agency policies and procedures on the establishment and maintenance of adequate conservation treatment on cropland. The task force report issued in April 1977 contained a number of recommendations (22). Among the key items were the following:

- Priority for field personnel should be redirected from project and nonfarm activities to planning, application, and maintenance of resource management systems on cropland.

- Three actions should be taken to compensate for loss of field personnel: (1) redirect field staff to locations having the most serious cropland treatment needs, (2) reduce field level paperwork, and (3) increase technical training and improve morale.

- Conservation planning assistance should continue, but with decreased paperwork, more flexibility available to the planner, and a 2-year maximum interval between initial planning and revisitation.

- Action should be taken to (1) support research into adaptation of conservation technology to modern agriculture, (2) support an information program to promote acceptance of conservation technology, and (3) revise the progress reporting system to reflect physical impacts of applied conservation measures.

The Conservation Technical Assistance program was recently analyzed by GAO as part of its larger study of USDA's soil conservation activities (2). This study is discussed in more detail later in this chapter, but its major findings with respect to the Conservation Technical Assistance Program are of importance here. GAO determined that SCS has taken a generally passive approach to carrying out the program by responding to farmers who seek assistance. The report indicated that much time was being spent preparing elaborate plans for individual farms, yet many plans reviewed by GAO were outdated, forgotten by the farmer, or never carried out or used in farming decisions. GAO recommended that SCS realign its priorities, aggressively seek out farmers whose lands have critical erosion problems, and provide the necessary technical and follow-up assistance.

As a result of the two studies described above, SCS changed the procedures for conservation planning to place less emphasis on the plan document and more emphasis on applied conservation. SCS also issued a new "National Conservation Planning Manual" which streamlines the planning process. The agency also refined its progress reporting system to emphasize land adequately treated and protected and to de-emphasize reporting of individual systems and practices. Targeting on the most critical areas is being encouraged through redirection and allocation of funds.

Agricultural Conservation Program (ACP)

ACP was authorized in the Soil Conservation and Domestic Allotment Act of 1935 (P.L. 74-46, 49 Statute 1148, 16 U.S. Code 590 g-o, 590a, and 590g). The program was implemented February 29, 1936, to assist agricultural producers in carrying out approved soil and water conservation measures through cost sharing. Two evaluations are summarized below.

GAO evaluated ACP to determine if cost-share monies were being used to implement erosion control practices or production-oriented practices (2). Their report pointed out that in recent years more money was spent for practices of limited or temporary value for erosion control than for enduring practices. GAO concluded that cost-shared practices involving drainage systems, irrigation systems, and liming of cropland were production oriented and had minimal soil conservation benefits. These practices were found to provide sufficiently high returns that cost sharing would not be a significant factor in a farmer's decision to apply such practices. GAO suggested some redirection of program emphasis with funding emphasis and priority given to critically needed and enduring conservation practices.

As a result of the GAO audit, ACP program emphasis for 1978 was placed on enduring practices. For 1979, the ACP redirection efforts were further strengthened by placing approval authority for county programs under the purview of state and national ACP development committees.

The Agricultural Stabilization and Conservation Service (ASCS), in cooperation with several other USDA agencies, recently completed the first phase of an evaluation of ACP (18). Three types of program impacts were studied: soil saved through application of sheet or rill erosion control practices, water conserved by application of improved irrigation efficiency measures or by construction of water impounding facilities, and effects of ACP forestry practices.

Information was collected from a stratified sample of 171 counties. ACP practices applied in the sample counties from 1975 through the first half of the 1978 program year were included in the study. Overall, 60,836 cases were reviewed. Each case represented a practice for which a farmer received cost-share assistance in a sample county. Erosion control impacts were estimated using the universal soil loss equation.

The evaluation showed a number of areas in which cost-effectiveness could be improved, particularly with respect to erosion control practices:

- Soil loss is being prevented and water is being conserved by the installation of most ACP practices. However, practice costs and results varied considerably by region of the United States and within each region.

- More than 52 percent of all erosion control practices studied were installed on lands eroding at annual rates of less than 5 tons per acre. About 27 percent and 21 percent of the erosion control practices were installed on lands eroding at annual rates of 5 to 14 tons per acre and over 14 tons per acre, respectively.

- 61 percent of the seeding practices are on land with annual sheet and rill erosion of less than 5 tons per acre.

- The cost-effectiveness of the nine erosion control practices studied was high in some cases and low in others. For example, establishing permanent vegetative cover ranked sixth in cost per ton of erosion reduction where annual erosion rates were less than 30 tons per acre. Stripcropping ranked among the more efficient practices in terms of cost per ton of erosion reduction. Interim cover was the least cost-efficient of all practices in reducing erosion regardless of the rate of erosion prior to treatment.

- In some cases, ACP practices are being applied on land where soil loss is already very low. Although other benefits such as water quality improvement may occur as a result, the cost per ton of soil saved is so high that investment in the practice is questionable.

ASCS has provided the evaluation results to agency officials and to state and county ASC committees for guidance in program development. The agency plans to expand the analysis beyond the 171-county sample area for future studies.

Great Plains Conservation Program (GPCP)

GPCP was authorized in 1956 by Public Law 84-1021 to minimize the hazards to agriculture in the plains states as a result of the area's erratic climate. In 1969, Public Law 91-118 expanded GPCP to provide for long-term contracts on nonfarm lands that were being severely eroded. Technical and financial assistance are provided through long-term contracts with land owners and operators who have a satisfactory conservation plan for their entire acreage and who have a timetable for implementation of the plan. Five evaluations of GPCP are summarized below.

The USDA Office of Audit examined GPCP in 1973 (8, 9). The objective was to determine whether or not SCS offices had " . . . effectively planned, developed, and implemented the GPCP in accordance with SCS procedures, guidelines, and within the spirit and intent of the program." The audit's findings were that contract modifications and rescheduling of practice installation were problems throughout the GPCP states. As a result of those findings, the GPCP Handbook was completely rewritten in 1976 to simplify program operations and to allow more flexibility in obligation changes and practice scheduling.

A 1974 SCS study analyzed program effects on erosion losses, the effects of alternative allocations of cost-share funds on selected program objectives, and the balance of impacts between erosion reduction and enhancement of agricultural income (19). It determined that GPCP cost sharing resulted in erosion reduction of about 221 million tons per year. If cost-share funds were allocated to states in such a way as to maximize erosion reduction, using the same combinations of practices then used, an erosion reduction of 256 million tons annually could be achieved. If funds were allocated among states as in the past, but with an optimal combination of erosion control practices used within each state, an annual erosion reduction of 367 million tons could be attained. Complete optimization of use of cost-share funds among both states and practices could produce an annual erosion reduction of 396 million tons. Therefore, at the time of the study, GPCP was achieving 56 percent of the estimated maximum level of erosion reduction. Subsequently, SCS revised its method of allocating GPCP funds among the states to some degree, although not to the full extent recommended in this study.

In 1976, GAO analyzed GPCP along with other USDA soil conservation programs (2). The report concluded that SCS had not made satisfactory progress in alleviating soil erosion problems in terms of the objectives established in 1956. Millions of acres of agricultural land remained in need of conservation treatment. GAO reported that some cost-share funds had been used for practices that had little impact on soil erosion. It also found that some land that had been seeded to permanent vegetative cover with GPCP cost sharing was being converted back to cropland at the end of the contract period. GAO recommended that SCS work more effectively with the farmers and ranchers who have the most critical erosion problems.

In response to this report, SCS revised its procedures to require that each state SCS office develop criteria for setting priorities that are tailored to the specific resource needs of the state. The agency is currently preparing a program environmental impact statement for GPCP. This process will lead to publication of new rules and regulations that will provide for more emphasis on high-priority program objectives.

In 1976, precipitation in South Dakota was about 50 to 55 percent of normal. As a result of the ensuing drought, the governor directed the formation of a committee to evaluate GPCP for its impacts on productivity in terms of practices that influenced soil moisture. He wanted to know how well GPCP "drought-proofed" the land. Statewide results from the survey showed that over twice as many nonparticipating units experienced drought-related problems as did participating units (22). For example, the ratio of nonparticipants to participants was 2.3:1 where stock water was inadequate, 2.6:1 where wind erosion damage was moderate or severe, and 2.4:1 where emergency pasture was needed.

South Dakota suffered from widespread drought again in 1980, and another study was made (25). This study also found that over twice as many nonparticipating units experienced drought-associated problems as did participating units. The ratio of nonparticipants to participants was 2.2:1 where stock water was inadequate, 3.7:1 where wind erosion damage was moderate or severe, and 2.1:1 where emergency pasture was needed.

Water Bank Program

The Water Bank Program was authorized in 1972 by P.L. 91-559 (84 Statute 1468, 16 U.S.C. 1301) to conserve surface water, to preserve and improve migratory waterfowl habitat and other wildlife-related resources, to reduce runoff and water and wind erosion, to improve flood control, to contribute to improved soil moisture, to reduce acres of new land brought into agricultural production, to retire lands now in production, to enhance landscape esthetics, and to promote comprehensive water management planning.

ASCS studied this program for the purposes of inventorying national wetland preservation needs, reviewing interactions with programs of the Department of the Interior (USDI), and analyzing past and current program effectiveness (16). ASCS found that program benefits exceeded costs when the level of waterfowl production was raised by an average of at least one duck per two acres. Potential conflicts between the program's wetland protection objective and the agricultural production emphasis of other USDA programs were noted. The report recommended that the Water Bank Program be strengthened by increasing USDI involvement, especially in identifying lands for participation in the program. It also suggested that there be greater coordination of the program with wetlands acquisition programs administered by USDI.

Steps have been taken since this evaluation to increase USDI involvement in the program. For example, USDI is currently assessing wetland values in all wetland areas covered by 1972 water bank agreements in 5 states. These agreements will expire in 1981, and the assessments will help determine if any should be renewed. The assessments also will identify wetland areas that may be eligible for participation in one of USDI's programs.

A subsequent report by GAO criticized the Department for not including other benefits such as flood control and ground water recharge in the benefit-cost ratio for the program (3). The report also recommended several changes in the program's authorizing legislation.

The RCA Appraisal examined trends in agricultural land use and conversion of wetlands. These trends were compared to past accomplishments of the Water Bank Program in protecting wetlands. The analysis concluded that the program would not substantially reduce the rate of conversion of wetlands to agricultural use (15).

Snow Survey and Water Supply Forecasting Program

Authority for the Snow Survey and Water Supply Forecasting Program is derived from Section 8, Reorganization Plan No. IV of 1940, 26 Statute 653, and 54 Statute 1234. Appropriations were increased in fiscal year 1975 to allow for implementation of the snow survey telemetry (SNOTEL) network. Through this program, SCS collects data on precipitation and the depth and moisture content of the snow pack on over 1,700 sites in the west. Analysis of these data serves to provide advance information about forthcoming seasonal water supply for streams that derive most of their flow from snowmelt. The program provides water users and water management groups in the western states with water supply forecasts. Forecasts are issued 3 to 6 times annually from January to June for nearly 500 western river locations.

SCS evaluated this program in 1975 to determine the effectiveness of the program and to estimate its benefits (21). SCS found that snow survey-based forecasts were more accurate in estimating snowmelt volumes than were forecasts based on precipitation data alone. The potential benefit-cost ratio calculated for the SNOTEL automated data collection network within the program ranged from 2.8:1 to 4:1. With full implementation of SNOTEL, the program was projected to generate agricultural irrigation benefits of approximately $50 million per year due to increased production and improved efficiency in resource use. These benefits would be generated at a total annual cost of $2.5 million, for a benefit-cost ratio of 20:1. The study also showed that over 7,400 users received the monthly snow survey reports and forecasts. Fifteen categories of users were reported. Agricultural users--including both individual farmers and ranchers, irrigation districts, and financial and commercial concerns that provided service to agriculture--made up over 50 percent of those who requested and received the reports.

Resource Conservation and Development Program (RC&D)

The Resource Conservation and Development Program is conducted under authority of Section 102 of the Food and Agriculture Act of 1962 (P.L 87-703), which amended portions of the Bankhead-Jones Farm Tenant Act (P.L. 75-210) and other existing Departmental authorities. SCS administers the program and provides technical and financial assistance for authorized projects. Several other USDA agencies (the Economic Research Service [ERS], the Extension Service [ES], the Farmers Home Administration [FmHA], and the Forest Service [FS]) also participate directly with RC&D funding.

This program provides technical and financial assistance to qualified local sponsors in designated project areas. The principal objectives of the program are (1) to promote the development, improvement, conservation, and use of natural resources and thereby provide economic opportunities to people of the project area, and (2) to assist local leaders in using new and existing agricultural programs in planning and implementing a program of natural

resource conservation and development. A key feature of the program is the formation of an organization known as the "RC&D council" to provide local leadership for planning and coordinating program activities to best meet locally identified needs and priorities. Each RC&D council is made up of representatives of local sponsoring agencies and organizations as well as other individuals from the RC&D area. SCS facilitates formation of the council and assists in the planning and implementation of the council's action program. Three studies of the program have recently been conducted as summarized below.

SCS completed an evaluation of selected impacts of the RC&D program in 1975 (20). The report concluded that:

- RC&D councils have been successful in implementing a program of technical and financial assistance that responds to perceived needs in local areas. Councils have been able to tap numerous state and federal sources of assistance and channel this aid into visible community improvements.

- More realistic project goals should be identified to guide the RC&D council in using RC&D technical and financial assistance more effectively.

- Detailed analysis of changes in total employment, median income, and per-capita income showed no statistically significant difference attributable to RC&D projects.

The report discussed several limitations of the methodology used in the evaluation, including the length of time the projects had been in place, sensitivity of secondary data, and use of cross-sectional data. It noted that the average RC&D project studied was less than four years old and therefore too new to have significantly affected county economic trends.

The USDA Office of Audit followed the SCS study with its own report (10). This report stated that project objectives were too broadly defined for progress to be measured and that the program's effectiveness could not clearly be determined nationally or in individual project areas.

These two studies led the Secretary of Agriculture to establish a special task force to study opportunities for program changes. The task force conducted field inspections of several projects, interviewed local citizens and RC&D council members, held public hearings, and reviewed the earlier reports. The task force concluded that while the program had been successful in achieving many of its objectives, it could be strengthened (12). The task force made 17 recommendations for program improvement and redirection.

At the time of printing, another GAO report on the Resource Conservation and Development Program was ready for release. This report (1) urges Congress to consider discontinuing use of program funds for financing project installation and (2) recommends fine-tuning of the overall management of the program (4).

Forestry Incentives Program

The Forestry Incentives Program was first authorized in 1973 and implemented in 1974. It currently operates under the authority of the Cooperative

Forestry Assistance Act of 1978 (P.L. 95-313). The Agricultural Stabilization and Conservation Service administers this program and provides cost sharing for tree planting, timber stand improvement and other forestry practices to increase the supply of timber and to enhance other forest resources. An evaluation of the first year's program was completed in 1977 (17). This analysis identified the most cost-efficient forestry practices in use at that time and identified several administrative actions that would improve the program's efficiency. The benefit-cost ratio for the program was estimated to be 5.6:1. Actions taken as a result of the evaluation include setting a minimum 10-acre size limit for planting, deleting the 5-year prior harvest rule, allowing for cost sharing more than once on the same acre to increase silvicultural and economic efficiency, and changing some rules to improve use of the limited forestry technical assistance.

Impact and Capability of Soil and Water Conservation Practices

The USDA Land and Water Conservation Task Force studied the impact and capability of soil and water conservation practices as part of its comprehensive review of conservation programs in 1979 (13).

The principal objective of the study was to evaluate the relative contribution of various conservation practices to these 13 conservation concerns:

- Watershed Protection
- Water Supply
- Cropland Productivity
- Pasture/Range Productivity
- Flood Control
- Drainage
- Irrigation Water Management
- Waste Management
- Timber Productivity
- Outdoor Recreation
- Land Reclamation
- Wind Erosion
- Habitat Development

Conservation practices include structural or agronomic measures that require site-specific design and installation as well as land and crop management techniques that are adopted by the land user. 2/ One of the key issues examined in this study was whether greater efficiency in conservation accomplishments could be achieved by emphasizing certain of these practices in USDA programs.

The study team used a reiterative series of questionnaires to gather expert opinions about the impact of various conservation practices. Groups of eight to eleven people knowledgeable about soil and water conservation participated within each of 21 state-Major Land Resource Areas (MLRA's) across the United States. Participants within each MLRA received feedback about the group response and had the opportunity to revise their answers on the next round in light of this feedback. The sample of state-MLRA units was selected to

2/ Structural and agronomic practices include such items as terraces, diversions, grassed waterways, and contour stripcropping. Management practices include conservation cropping systems (crop rotation), cover cropping, and conservation tillage.

represent a diversity of conservation problems rather than a nationally representative sample. The key findings are summarized below:

- Individual practices do not fully control resource problems. The level of problem control most commonly reported was only about 50 percent. The findings indicate that performance of many individual practices may not achieve the conservation objectives. Combinations of practices are usually more effective than individual practices.

- Overall conservation value and cost-effectiveness are higher for some management practices than for engineering practices. Management practices related to objectives for cropland productivity and pasture or range productivity commonly affect other objectives such as watershed protection and flood control. These management practices tend to have a higher conservation value than structural practices. Management practices are frequently more cost-effective and may need to receive increased program emphasis, even if they must be repeated annually.

- The costs to users and the levels of education and apathy among users limit the adoption of conservation practices. Installation and maintenance costs tend to be the most important factors in limiting the use of structural practices. This suggests the need for increased financial assistance for structural practices and greater educational and motivational effort coordinated among the various federal agencies and state institutions. Additional program emphasis on these areas would increase the annual demand for technical assistance.

Findings of the 1977 GAO Study

In February 1977, the GAO issued its report on three major USDA conservation programs--Conservation Technical Assistance (Conservation Operations Program), Agricultural Conservation Program, and Great Plains Conservation Program. Specific findings for each program were reported earlier in this chapter. Perhaps more important than the individual results was the composite picture presented by the report.

The study focused on erosion control and found that each program fell short of achieving its objective. Two major problems were common to all three programs. First was lack of attention to the objective of erosion control, which GAO considered to be a national priority to sustain agricultural productivity. Program personnel and financial resources were found to be directed toward other objectives such as water management and production enhancement to a substantial degree, even though serious erosion problems were present in the areas studied. 3/ Second was a lack of priority setting. GAO found little or no effort being made by the agencies to give priority assistance to farmers and ranchers with the most serious erosion problems.

3/ Later in 1977, GAO issued a report that criticized the Department for not providing enough financial assistance for water conservation in irrigated areas (1). The report cited the growing demand for water in the West as a reason to direct more ACP funds to assist in the reorganization of irrigation systems. These two reports exemplify the difficulty in evaluating multiple-purpose conservation programs.

None of the three programs was concentrating scarce resources on the most effective erosion control measures, nor were they working with the people who most needed help in reducing erosion.

In its analysis of conservation technical assistance, GAO identified a problem of interagency coordination that has implications for USDA conservation activities in general. For example, the report cited a number of instances where farmers received conflicting recommendations for soil and crop management from Extension Service personnel and SCS conservationists. Conflicts between soil conservation objectives and the operation of some USDA price support and allotment programs were also identified. Although program modifications since the time of this study have resolved some of these conflicts, the potential for such difficulties should be considered in the future.

Both ASCS and SCS made program changes in response to the GAO study, as noted earlier in this chapter. These changes included increased emphasis on enduring conservation practices, revision of conservation planning procedures, and redirection and targeting of funds. The results of such changes have yet to be evaluated.

Implications for Program Formulation

The foregoing studies identified the strengths and weaknesses of present soil and water conservation programs. The findings, taken collectively, suggest the following for use in the formulation of future programs.

- o Clear program objectives and priorities are needed. A lack of clear purpose for individual programs and for USDA's soil and water conservation efforts collectively have led to inefficiencies and reduced program effectiveness. Too many human and financial resources are being spent on conservation activities that have little impact on major problem areas. Field personnel need more definitive guidance on policy objectives and priorities.

- o Identification of critical problem areas is important at all levels. Knowing where and with whom to work and to whom to provide assistance are just as critical as knowing what objectives are paramount. The RCA Appraisal shows that conservation problems are not uniformly distributed. Some regions are more critical from a national perspective, and within regions some localities and farms have more critical resource problems than others.

- o The effectiveness of conservation systems varies by geographic region of the country. The costs and benefits of conservation systems vary by region. Programs and policies should allow for selection of conservation systems that most effectively meet local needs and still meet national objectives.

- o Local involvement is needed. Involvement of individuals and local organizations in program decisions increases program acceptance and effectiveness.

- Management practices should receive appropriate emphasis in solving critical resource problems. Such practices can be more cost-effective than structural practices in some situations.

- Better coordination is needed among USDA agencies. Conservation efforts have been somewhat hindered by policies, procedures, and assistance of different agencies that are not fully compatible. A concerted USDA effort to address serious soil and water conservation problems would be more effective if more unanimity of purpose were achieved.

- Conservation systems are generally more effective than single practices. Findings indicate that application of an individual practice may not achieve the maximum cost-effectiveness in solving a resource problem. USDA programs should provide for systems of conservation practices that address identified problems on a particular site most cost-effectively.

- The full impacts of USDA soil and water conservation programs must be monitored and evaluated. For example, conservation tillage appears to be a very cost-effective erosion control practice. However, the effects of increased herbicide and pesticide use in conjunction with this practice need to be monitored to determine if the direct benefits are being offset by other forms of resource degradation.

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CHAPTER 6
PROGRAM ALTERNATIVES AND OPTIONS CONSIDERED

In developing the program required by the Soil and Water Resources Conservation Act of 1977 (RCA), the Secretary of Agriculture was directed to identify and evaluate "alternative methods for the conservation, protection, environmental improvement, and enhancement of soil and water resources." To comply with this provision of the law, the Secretary first set long-term conservation objectives and then, within budgetary limitations, developed program alternatives for meeting these objectives.

This chapter presents the alternatives that were developed and shows the likely environmental, social, economic, and physical effects of each. The Secretary's preferred program is presented in chapter 7.

Objectives for a Soil and Water Conservation Program

In the RCA Draft Program Report and Environmental Impact Statement (3) that was distributed for public review in January 1980, the United States Department of Agriculture (USDA) proposed twenty objectives for a program of soil and water conservation on nonfederal lands. The following long-term conservation objectives were decided upon after considering the responses from the public (4) on the proposed objectives, the findings of the RCA Appraisal, and the results of the survey conducted for RCA by Louis Harris and Associates, Inc., (1) in October and November 1979:

(1) Develop a program that will lead toward nondegradation of the Nation's soil and water resources. Address erosion and other factors that reduce the long-term productive capacity of these resources to maintain the quality of the resource base. Assist land owners in applying and maintaining soil and water conservation systems that assure sustained productivity on 297 million acres--141 million acres of cropland, 124 million acres of rangeland, 17 million acres of forest land, and 15 million acres of pastureland--threatened by excessive erosion. Maintain conservation systems on lands that would be subject to excessive erosion unless they were treated.

(2) Reduce flood damages by the year 2000 by 16 percent from projected levels. Use modern technology to apply structural and nonstructural solutions in areas where the threat to human life, agricultural lands, and property is greatest. Move toward more emphasis on nonstructural means of reducing upstream flood damages. Help the Federal Crop Insurance Corporation (FCIC) identify soils where the risk of flood damage is high, occurs frequently, or is excessive, to avoid use of all-risk flood insurance without full consideration of these conditions.

(3) Improve 245 million acres of rangeland currently in "poor" or "fair" condition as identified in the 1977 National Resource Inventories to "good" condition.

(4) Assist land owners in increasing the onfarm and off-farm levels of irrigation efficiency from the present 53 and 78 percent to 66 and 87 percent, respectively. Target program efforts to areas where irrigation has a major impact on surface and ground water supplies, water quality, instream flows, and economic stability. Limit water conservation assistance to better management where ground water supplies are being depleted so fast that withdrawals of ground water may soon be infeasible. Provide appropriate assistance to help individuals make the transition to dryland farming or other occupations in these areas.

(5) Achieve more effective use of water, including soil moisture, in meeting demand for agricultural output in a manner that is environmentally and economically defensible. Support state efforts to modify legislation and institutions to develop a more market-oriented system for water resource allocation, use, and conservation. Improve the reliablility of available water supplies needed for agricultural use.

(6) Continue the present USDA role of responding to initiatives by state and local governments and the Environmental Protection Agency to reduce agricultural nonpoint source pollution of water. Conduct research and analysis to establish the quantitative relationships between soil erosion and the amount of nutrients and toxics that enter surface water. Evaluate the effects and effectiveness of alternative resource management systems in reducing nonpoint source pollution from agriculture. Approach a zero level discharge of toxic pollutants at the earliest feasible date. Give highest priority to areas of greatest threat to human health and safety. Reduce erosion and sedimentation below the levels required to maintain soil productivity where necessary for protecting lakes, reservoirs, harbors, and fish spawning areas as these needs are determined and initiatives taken by the states.

(7) Encourage and advocate the retention of prime and unique farmland to the maximum extent possible under prevailing policies and through support of state and local initiatives.

Priorities

From the public comments received, the findings of the RCA Appraisal, and the results of the Harris survey, the following soil and water resource priorities were identified to be applied in developing program alternatives. These priorities apply more fully to alternatives 2 and 3 than alternative 1, since alternative 1 reflects primarily a continuation of existing program trends without any major redesign of existing programs. The priorities, in order, are: (1) reduction of excessive soil erosion; (2) reduction of upstream flood damages; (3) conservation of water, enhancement of water quality and supply, and conservation of resources related to urban areas and communities; and (4) improvement of fish and wildlife habitat, and increased use of organic waste. Actions in support of the first and second priorities will contribute significantly to achievement of objectives for the other priorities.

Program Alternatives

The alternative soil and water conservation programs address both short- and long-term resource problems, but they are developed in detail only for the next 5 years. This is consistent with the RCA legislation, which provides for updating the program at 5-year intervals. The three basic alternatives are:

Alternative 1.--Continuation of current program trends.
Alternative 2.--Redirection of federal programs toward agricultural resource problems with emphasis on targeting to critical problem areas, especially agricultural soil erosion.
Alternative 3.--Expanded emphasis on state and local roles and leadership with redirection in federal programs as described in alternative 2.

Funding Levels for Alternatives 2 and 3

In designing alternatives 2 and 3, different levels of funding were considered. Three funding levels were presented as options within each alternative: (1) the current funding level sustained in constant dollars, (2) an increase in funding (the "upper bound"), and (3) a decrease in funding in constant dollars (the "lower bound").

Current (1981) funding for soil and water conservation programs, aside from loans, is $837 million in constant 1979 dollars. The first scenario would be to maintain this funding level, in constant dollars, for 5 years.

The upper bound scenario would permit a 3-percent annual increase, compounded in constant 1979 dollars, from 1981 appropriations. Funding would increase from $837 million in the base year to $971 million, excluding loans, in the fifth year.

The lower bound scenario would require a 6-percent reduction from the $837 million base the first year and a 3-percent annual reduction, compounded in constant 1979 dollars, each of the following 4 years. Funding would decline to about $698 million by the fifth year.

These limits represent the probable range of spending for conservation programs over the first 5 years, barring national emergency. The selection of a preferred alternative does not depend on a specific funding level.

If there were no changes in program design, reducing soil erosion to the nondegradation level would require an annual increase of about 13 percent, compounded in constant dollars, for 5 years and expenditures held at that level through 50 years.

Under alternative 1, erosion would continue at the present rate unless increasing demands for agricultural commodities caused cultivation of large acreages of marginal land. At that time, total erosion would increase rapidly. Alternatives 2 and 3 would reduce erosion slowly, with the greatest reduction at the upper bound scenario. Even with the most optimistic outlook--the upper bound scenario of alternative 3--soil erosion after

50 years would still exceed the nondegradation level. These effects are more fully explained under each alternative.

Program Actions for the First Five Years (Short-Term Objectives)

The following actions will be taken regardless of the program alternative selected. Emphases will vary, however, according to the alternative selected and the funding level.

(1) Target increased efforts to areas where erosion threatens long-term agricultural productive capacity. Focus on conservation measures that are most cost-efficient in sustaining agricultural productivity. Improve the information base for evaluating the relationships between soil erosion and agricultural productivity.

(2) Concentrate efforts to reduce upstream flood damages where total damages to rural communities, cropland, and pastureland are high. Permit upstream flood prevention activities to be targeted to areas where there is serious damage to high-priority environmental and social values.

(3) Continue the current level of effort to conserve water and improve supply. Respond to initiatives of private individuals and local and state governments, who will finance water conservation and supply activities. Analyze and evaluate the influence of projected long-term changes in water and energy supply on the costs and benefits of agricultural production and determine the implications of the findings for future land use policies and priorities. Identify private benefits, public issues, and opportunities for more effective action in conserving and improving water supplies. Accelerate appropriate research and education services to meet basic technology and information needs.

(4) Continue experimental and research activities to improve and evaluate water quality. Initiate new or expand existing pilot projects to cover all important water quality problems. Implement projects only after an adequate design for evaluation of effectiveness has been prepared. Use current fundings to the extent possible for pilot projects. Continue cooperative relationships with state and local governments and the Environmental Protection Agency and respond to requests from these sources for technical assistance and education.

(5) Continue to respond to requests from communities for information and technical assistance. Respond to requests for assistance from states and localities in planning and developing land use guidelines and regulations. Provide information for flood hazard studies consistent with available resources and the lead roles of the Department of Housing and Urban Development and the Army Corps of Engineers.

(6) Provide technical assistance for cost-efficient, energy-conserving practices in onfarm operations consistent with the protection of the resource base.

(7) Continue to provide educational and technical assistance for fish and wildlife habitat improvement as funds and time permit. Give priority to

developing and analyzing data to portray the net social value of fish and wildlife habitat improvement activities.

(8) Continue the current level of assistance to those who use organic wastes. Conduct appropriate research on effective ways of handling and using organic wastes for improving soil tilth and fertility.

Alternative 1
Continuation of Current Program Trends

No major change in conservation program content would be initiated under this alternative. Continuation of recent trends would result in changes in the program assistance offered. These trends would be altered only when and to the degree that the budget authorization for a given fiscal year altered the historical pattern. Table 6-1 presents the trends in funding for major components of the program since 1969 and 1976. It also shows the projected changes through the 5-year RCA program period.

Summary of Effects

Under alternative 1, funding in constant dollars for USDA soil and water conservation programs by the fifth year would be 86 percent of funding for fiscal year 1981. If current trends continued--

- o funding for research, education, data collection, and analysis would increase. These activities would help USDA better identify and understand resource conditions, trends, and problems.

- o cost-share funds for installing conservation measures on agricultural lands would decline sharply, from about 33 to 23 percent of the total by the fifth year.

- o funding for technical assistance would remain constant.

- o an increased portion of the available funding would be used to provide financial assistance for group action and rural community soil and water conservation projects. Although these are popular and useful activities, they are not always directed toward the high-priority problems of soil erosion and upstream flood damages.

- o funding for group loans to nonprofit associations and public entities for watershed protection, irrigation and drainage, and resource conservation and development projects would decrease. If appropriate priorities and targeting were applied, these loans could contribute substantially to achieving the objectives of the RCA program.

- o USDA commitments to authorized Experimental Rural Clean Water Projects would provide information for use in evaluating the potential effectiveness of soil and water conservation systems in reducing pollution from nonpoint agricultural sources.

- o initial USDA efforts to target on critical problem areas would be hampered by declining funding for cost sharing.

- o the proportion of program funds dedicated to reducing upstream flood damages would increase, but total funding for this purpose would decline

slightly. The proportion of funding for conservation of soil resources would be reduced. These funding trends would not allow the Department to address adequately the priorities established through the RCA process.

- o reduced funding levels for cost sharing could threaten the continuation of the county Agricultural Stabilization and Conservation (ASC) committee system in some counties.

- o total soil erosion would decrease slightly. The acreage of cropland with sheet and rill erosion in excess of tolerable limits would also decrease by a small amount.

State and local response.--Under alternative 1, USDA's direct capability to promote soil and water conservation measures on agricultural lands would be reduced. Total financial assistance to communities and groups for addressing resource-related problems would decline. Thus, the Department would have to rely more on local and state governments, other federal agencies, and private organizations and individuals for conservation on agricultural lands.

There has been a trend toward increased funding and servicing of conservation programs by state and local governments. These commitments, however, usually rely on sustained or expanded USDA research, information, and financial and technical assistance. There is no assurance that this trend would continue as USDA program funding declined. USDA programs in research, education, and data collection and analysis, however, could provide information useful to local and state governments in identifying problems and establishing priorities. Suppying this information would result in increased activity at the local and state level, where the financial and technical capability may exist to deal with these problems despite reduced funding for USDA programs.

Relationship to the public's comments.--Alternative 1 would not respond to the public's desire to reduce soil erosion and maintain soil productivity. A substantial majority of the comments on the 1980 RCA draft documents indicated that soil and water conservation should be given a higher priority and that the federal government should do more and not less in addressing these needs.

Political and legislative considerations.--No new legislation would be required for adoption of alternative 1. Expiring program authorities would need to be reauthorized.

Although soil and water conservation has widespread popular support, public opinion favors improvements in program effectiveness. Alternative 1 is likely to be viewed as being unresponsive to public opinion.

Distributional effects.--Alternative 1 would result in slight increases in production costs because of the effects of increased soil erosion. Rural communities would benefit from actions to reduce upstream flood damages. The effects on water quality would be mixed. Areas protected from upstream flooding and lands treated for erosion control would improve, but areas with inadequate conservation treatment would deteriorate. The long-term effects of alternative 1 could be examined more fully and actions redirected as appropriate in subsequent appraisals and program recommendations through the RCA process.

It is unlikely that land owners and operators would receive all the assistance and incentives they would need to meet the Department's soil and water conservation objectives. USDA would likely provide more program services to large producers in order to lessen the long-term impact of erosion and other resource problems.

Table 6-1.--Projected fifth-year distribution of funds among major components, alternative 1

[Dollar figures are in constant 1979 dollars rounded to the nearest million.]

Major component	1981 fiscal year funding level				Projections	
	Millions of dollars	Annual percentage of change from-- 1969	1976	Percentage of total funding	Millions of dollars	Percentage of total
1. Technical assistance----------	198	-0.1	No Change	23.7	198	27.5
2. Financial assistance:						
a. Cost shares to operators----------	278	-5.9	-5.4	33.2	167	23.2
b. For project activities----	177	No Change	-2.9	21.2	161	22.4
c. Total financial assistance----------	(455)	----	----	(54.4)	(328)	(45.6)
3. Education/Information (Extension Service)----------	12	+5.1	+2.4	1.4	14	1.9
4. Research and technology development----------	74	+1.6	+0.2	8.8	76	10.6
5. Data collection and analysis----------	81	+2.3	+3.9	9.7	86	12.0
6. Emergency programs 1/---------	17	----	---	2.0	17	2.4
TOTAL----------	837	----	----	100.0	719	100.0
Loans----------	(77)	----	----	----	(50)	----

1/ Held constant because emergencies cannot be predicted.

Alternative 2
Redirection of USDA Programs
Toward Critical Agricultural Resource Problems

Alternative 2 is designed to use the existing conservation programs but to emphasize problem-solving activities in areas of critical concern. Conservation activities in other areas would continue to receive attention. Such redirection of program activities would help to control the most serious resource problems while maintaining resource conditions in other areas.

Highlights

Alternative 2 focuses more strongly than alternative 1 on solving critical resource problems. Alternative 2 would provide for--

- o funds and program services targeted to high-priority problems (especially soil erosion and upstream flood damages).
- o commitment by the Agricultural Stabilization and Conservation Service (ASCS) and the Soil Conservation Service (SCS) of an additional 5 percent of their budget each year to specified high-priority areas until 25 percent of their financial assistance and technical assistance funds are committed to these areas.
- o budget coordination through a policy-level committee established by the Secretary of Agriculture to ensure that budget and program plans among USDA conservation agencies are consistent with each other and with priorities developed by the Department.
- o special emphasis on conservation tillage and other cost-efficient conservation systems in all program components.
- o pilot projects for testing new approaches to soil and water conservation.
- o continuation of water conservation and supply activities at current levels and of experimental water quality protection activities.
- o minimize conflict among features of USDA farm programs that would impede attainment of conservation objectives.

Designation of National Priority Areas

Under alternative 2, USDA would designate geographical high-priority resource problem areas, normally multi-county areas. Designation would be based on the existence of excessive agricultural erosion, high annual upstream flood damages, or other serious resource problems, and the likelihood of voluntary land owner participation.

Some of the available funds and personnel would be directed toward these target areas. The objective would be to concentrate technical and financial assistance to solve problems in these areas. These efforts would tend to focus on the worst problems first to achieve the highest possible result.

Each year for the next 5 years, SCS and ASCS would commit an additional 5 percent of their technical and financial assistance funds to these specified high-priority areas until 25 percent of these funds were committed to these areas.

Interagency Coordination

USDA would use the existing budget formulation and execution process to achieve coordination of conservation programs in all agencies. The Secretary would establish a committee to review requests and ensure that budgets are coordinated among the soil and water conservation agencies. Extensive exchange of data and information combined with guidance from the Secretary would result in agency budgets and program plans that were consistent with established priorities and objectives and that were coordinated for the most effective program delivery at the local level.

Conservation Tillage and Other Cost-Efficient Systems

Conservation tillage is one of the newest and most successful techniques for erosion control. Residue from a previous crop is left on the land surface and tillage operations are reduced. This method can be highly effective in reducing excessive erosion at a reasonable cost. It offers promise as the initial stage of a conservation farming system for controlling erosion and preserving the productive capacity of cropland.

Conservation tillage has both benefits and drawbacks. It reduces or eliminates soil disturbance and uses less fuel than conventional tillage. Increased use of chemicals to control undesirable weeds and insects is required, however, resulting in a greater potential for environmental degradation. Conservation tillage is less effective where special problems such as wet or cold soils exist. The specialized farm equipment needed for conservation tillage is expensive.

Alternative 2 would give high priority to applying and maintaining conservation tillage methods on excessively eroding cropland. It would emphasize on educational and technical assistance to land owners for successful application of existing conservation tillage technology, research on integrated pest management, and development of technology adapted to cold or wet soils. Increased research would identify the long-term effects of conservation tillage on soil structure, tilth, moisture holding capacity, and other factors important to sustained productivity.

Upstream Flood Damage Reduction

Reducing damage to rural communities and agricultural lands from flooding would be a priority second only to erosion control and maintenance of soil productivity.

USDA's watershed protection and flood prevention activities would be targeted to areas where excessive soil erosion and actual or potential and high average annual flood damages are problems for agriculture and rural communities. Emphasis would be given to the most cost-effective techniques for solving the problems. USDA would give additional help to local communities in assembling and interpreting resource data and in applying nonstructural remedies to flooding problems.

Rangeland Management Systems

Emphasis would be given to the adoption of soil conserving management systems on nonfederal rangeland and pasture land. The objective would be to reduce soil erosion and increase the future productivity of these resources by encouraging and supporting the adoption of scientific principles and methods of managing forage resources.

Woodland Management Systems

USDA programs to encourage increased use and application of conservation methods to sustain and improve the productivity of nonfederal woodlands were presented in the Forest and Rangeland Renewable Resources Planning Act (RPA) report developed by the Forest Service and submitted to Congress in June 1980.

Other Important Elements of a Redirected USDA Program

USDA would provide information and support for state and local initiatives that address problems associated with the conversion of agricultural land to nonagricultural uses. Programs for water conservation, water supply management, and water quality protection would continue at the current proportion of total funding. Water quality protection activities would continue as experimental projects until there were sufficient data and analyses to evaluate needs and develop effective programs.

Pilot Projects

Alternative 2 would include pilot projects and special studies for solving resource problems and furthering soil and water conservation objectives. The primary purpose of pilot projects or special studies would be to find more effective solutions to existing problems and to test potential solutions to persistent or emerging problems and issues. Projects or studies could be initiated to--

- introduce and evaluate promising new technology for conserving soil and water.
- evaluate the long-term consequences of reliance on specific technologies, priorities, or policies for soil and water conservation.

- evaluate alternative program mixes and components for achieving conservation objectives. Examine the relative roles of technical and financial assistance and education and information activities in accomplishing soil and water conservation objectives. Examine the relative merit and effectiveness of annual payments, long-term agreements, and subsidized loans as incentives to adoption of soil and water conservation systems.

- test and evaluate increased use of regulatory authorities, conservation easements or endowments, performance payments, or tax incentives as tools in soil and water conservation. Such projects could be carried out in cooperation with state or local governments.

Summary of Effects

Adoption of alternative 2 would have the following effects by the fifth year relative to alternative 1:

- More erosion would be controlled and upstream flood damages reduced. Estimates indicate that by the fifth year, total annual sheet and rill erosion could be reduced, compared to altervative 1, by 300 million tons at level funding, by 420 million tons at upper bound funding, and by 90 million tons at lower bound funding.

- The need for additional cropland because of increasing demand for agricultural commodities would bring a significant acreage of erodible land into production. Therefore, erosion would be excessive on 126 million acres at level funding, 121 million acres at upper bound funding, and 131 million acres at lower bound funding. This compares to an estimate of 135 million acres of excessively eroding cropland under alternative 1.

- Annual upstream flood damages would be reduced, compared with current trends, by $7 million at upper bound funding, by $4 million at level funding, and by $2 million at lower bound funding.

- No significant savings of water used in agriculture would be expected under alternative 2 compared to alternative 1 because of the emphasis on erosion control and the reduction of upstream flood damages.

- More assistance would be provided to land users with significant conservation problems through targeting of programs to critical areas. (There would be a corresponding reduction in the amount of assistance available to non-targeted areas, especially at lower bound or level funding.)

- Use of energy in agricultural operations would be more efficient because of increased use of conservation tillage and reduction of upstream flood damages.

- The amount of sediment that reached streams and lakes would be further reduced.

- Research and education services for defining solutions to resource problems and for providing needed technology would be expanded.

Under alternative 2, some programs or program components could be phased out as more attention is given to priority objectives. These adjustments would affect mostly fish and wildlife habitat improvement and organic waste management programs. The lower bound funding scenario would likely result in a delay in completing field mapping for the National Cooperative Soil Survey.

Implementation of alternative 2 would permit continuing degradation of the Nation's resources. Excessive erosion would continue to reduce the long-term productivity of some agricultural lands, especially at lower bound funding.

State and local response.--States and localities included in targeted areas could be expected to respond favorably to this alternative because they would receive more direct assistance. Conversely, states and localities not in targeted areas could be expected to object to any reduction in services. The level of support and potential participation by state and local governments could be influenced by the designation of targeted areas.

The public comments about the 1980 RCA draft documents, including a large segment of the comments from respondents representing state and local entities, indicated a strong preference for a more active state and local role in conservation programs.

Political and legislative considerations.--No legislation would be required to authorize redirection of existing programs beyond the extension of any components that are scheduled to expire during this 5-year period. There would be considerable political support for a redirected program. Areas that would not directly benefit from a redirected program, however, might oppose alternative 2.

Distributional effects.--Targeting on high-priority areas could tend to reduce participation in soil and water conservation programs in non-targeted areas. This shift probably would reduce assistance to small and part-time farmers more than to larger operators. Increased incentives to cover the higher costs that small and part-time farmers would incur in adopting acceptable conservation systems, however, could be provided in nationally identified critical areas.

Program costs and staffing.--By the fifth year, federal program funding would be expected to fall between about $971 million (the upper bound), in constant 1979 dollars, excluding loan programs, and about $698 million (the lower bound).

Staffing requirements would tend to reflect the program services needed for the particular funding level selected. Total employment could increase by as much as 10 percent over current levels under upper bound funding. Similarly, employment could decrease an estimated 10 percent from current levels by the fifth year at lower bound funding. Actual staff requirements would be influenced by the combination of activities undertaken and the actions of state and local governments in funding and staffing conservation programs.

Table 6-2 displays how available funds would be redirected to give increased emphasis to high-priority resource problem areas. Table 6-3 shows how the percentage distribution of funds would change under different funding scenarios.

Table 6-2.--Projected fifth-year distribution of funds among major components, alternatives 1 and 2

[All figures are in constant dollars rounded to the nearest million.]

Major component	1981 (Base year)	Alternative 1	Alternative 2		
		Current trend continued	Level funding	Upper bound	Lower bound
1. Technical assistance-------	198	198	219	225	185
2. Financial assistance:					
a. Cost shares to operators----------	278	167	261	328	209
b. For project activities--	177	161	167	211	134
c. Total financial assistance----------	(455)	(328)	(428)	(539)	(343)
3. Education/Information (Extension Service)--------	12	14	14	15	10
4. Research and technology development----------	74	76	80	88	71
5. Data collection and analysis----------	81	86	79	87	72
6. Emergency programs 1/-----	17	17	17	17	17
TOTAL 2/----------	837	719	837	971	698
Loans----------	(77)	(50)	(72)	(80)	(60)

1/ Held constant because emergencies cannot be predicted.
2/ Total funds were projected using a linear regression method separately from the individual components. The latter were then adjusted to fit the total.

Table 6-3.--Projected fifth-year percentage distribution of funds among major components, alternatives 1 and 2

Major component	1981 (Base year)	Alternative 1 Current trend continued	Alternative 2 Level funding	Alternative 2 Upper bound	Alternative 2 Lower bound
1. Technical assistance------	23.7	27.5	26.2	23.2	26.5
2. Financial assistance:					
a. Cost shares to operators----------	33.2	23.2	31.2	33.8	29.9
b. For project activities-	21.2	22.4	19.9	21.7	19.3
c. Total financial assistance----------	(54.4)	(45.6)	(51.1)	(55.5)	(49.2)
3. Education/Information (Extension Service)------	1.4	1.9	1.7	1.5	1.4
4. Research and technology development----------	8.8	10.6	9.6	9.1	10.2
5. Data collection and analysis----------	9.7	12.0	9.4	9.0	10.3
6. Emergency programs 1/----	2.0	2.4	2.0	1.7	2.4
TOTAL----------	100.0	100.0	100.0	100.0	100.0
Total dollars (millions)---	(837)	(719)	(837)	(971)	(698)

1/ Held constant because emergencies cannot be predicted.

Alternative 3
Increased Local and State Role

Alternative 3 recognizes and enhances support for the growing involvement and commitment by state and local governments for conserving and sustaining the productive capacity of the nonfederally owned soil and water resources of the Nation. This trend, coupled with the projected need for a more effective soil and water conservation program, indicates that it is timely and appropriate to give more formal recognition to this expanding partnership. Under alternative 3, total federal, state, and local resources devoted to conservation would be greater than under alternatives 1 or 2 for a given level of federal funding. Conservation accomplishments and program effectiveness would also be greater because of increased local and state awareness and participation and stronger leadership in program development.

Highlights

Alternative 3 includes the emphasis on solving critical resource problems and the other features of alternative 2. Furthermore, alternative 3 strengthens the role of state and local governments in developing and implementing conservation programs. Alternative 3 provides for--

- cooperative efforts with state and local governments in targeting a larger share of available USDA conservation funds and personnel to critical areas where erosion threatens the long-term productive capacity of the soil. Concentrates efforts to reduce upstream flood damages in areas where total damages to rural communities, cropland, and pasture are high. Emphasizes conservation measures, such as minimum tillage, that are most cost-efficient in reducing erosion.

- an agreement between the Governor and the Secretary as the basis for more effective cooperation in meeting soil and water conservation objectives.

- a Local Conservation Coordinating Board to use the existing local, state, and federal relationships and programs more effectively in meeting the needs and priorities identified in the statewide soil and water conservation program.

- a State Conservation Coordinating Board to develop the state conservation programs after consideration of the local programs. These state boards would be assisted by a technical committee composed of representatives of state agencies, USDA agencies, and other federal agencies.

- a National Board, appointed by the Secretary of Agriculture, to consider the state programs, make recommendations on allocation of matching funds to states, and establish priorities for treating problem areas.

- variable-rate matching USDA grants to a state agency designated by the Governor for financial and technical assistance to carry out state or local activities in critical resource problem areas of national significance.

- pilot projects to evaluate actions needed to deal more effectively with persistent conservation problems and test potential new solutions.

- conservation plans consistent with locally determined standards for eligibility for Farmers Home Administration loans.

- tax incentives as an inducement to increased use of conservation systems.

- USDA support for states to develop conservation practices acts, such as the ones that Iowa, Illinois, and other states have already developed.

Alternative 3 would provide technical and financial assistance to land owners and operators for planning and applying conservation measures. This assistance could be available through regular USDA programs and, where appropriate, through state and local programs funded in part by federal grants. The source of the assistance would vary depending on the ability of the state to provide it.

Alternative 3 includes the concept of a "base plus special emphasis" approach for federal technical assistance. A "base level" of USDA presence would be determined for each state according to what was needed to gather and interpret resource data, to assist in the development of resource plans, to maintain existing conservation practices and projects, and to provide basic USDA services to program participants. The "base level" would vary among the states. States with a high degree of technical and administrative capability would tend to rely less on USDA than would those states lacking these abilities.

Also, the severity of conservation problems, and consequently the program needs, would influence the base level staffing for USDA agencies. Staffing above the base level would correspond to the severity of the problem.

Setting Priorities

At the local level, alternative 3 provides for the identification of soil and water conservation problems by members of a Local Conservation Coordinating Board. The local board would establish priorities for treatment of problems, identify what treatment is needed, and recommend a conservation program to a State Conservation Coordinating Board.

The state board would review the county-level programs and priorities and from them develop a state plan and priorities that would guide the state program. The state plan would be reviewed at the national level. The designated state agency would develop and administer the state's cost-sharing, loan, and technical assistance programs, supported with federal-state matching funds, with which land owners and operators would meet the needs identified in the approved state plan.

A National Conservation Board would review the state programs and recommend the allocation of matching funds to the states and the establishment of priorities for treating areas with resource problems of national significance. Up to 50 percent of the federal share of the matching funds would be allocated to national priorities designated by the Secretary. The rest would be allocated among participating states according to needs identified at the state level.

Cooperative Agreements

Alternative 3 would be carried out through a memorandum of understanding entered into by the Governor of each participating state and the Secretary of Agriculture. The primary purposes of the agreement would be to (1) establish a cooperative local-state-federal soil and water conservation program, (2) provide for local, state, and national boards to develop and implement the cooperative program, (3) jointly identify priorities for controlling agricultural soil erosion and sedimentation and other problems affecting resource productivity, and (4) provide for matching federal, state, and local funds to help land owners reduce soil erosion and sedimentation.

The agreement would stipulate that--

- o agricultural land is a local, state, and national resource, as well as a resource that is mostly privately owned.

- o the management and use of that land influence both current and long-term agricultural productivity, water quality, and other environmental values affecting state, regional, and national welfare.

- o decisions, almost entirely local, about the use and management of agricultural land have cumulative impacts on the economy and the environment. Those impacts are occuring and will continue to occur at state, regional, national, and even international levels because of the strong demand foreseen for food, fiber, and new energy resources to be produced on agricultural land.

- o states and the federal government must work with local interests to minimize the adverse impacts of critical soil erosion and sedimentation on agricultural productivity, water quality, and other public values.

Local and State Programs

Local program.--Local soil and water conservation programs would be developed for individual counties, or for groups of counties, through the leadership of Local Conservation Coordinating Boards.

Each Local Conservation Coordinating Board would be established under procedures defined by a State Conservation Coordinating Board. The local board would provide the leadership for identifying local resource problems and developing and implementing the local programs consistent with statewide guidelines and standards.

This board--composed of representatives of conservation districts, the county ASC and extension advisory committees, and locally determined representatives of user groups and elected officials--would develop the conservation program and establish priorities. In developing and carrying out the program, it would use existing USDA programs and services to the extent that they are available. Where additional program resources are needed to meet high-priority objectives, the needs can be brought to the attention of the State Conservation Coordinating Board. USDA agencies would designate local representatives of their agency as technical advisors to the Local Conservation Coordinating Board.

The local program would include provisions for identifying areas of critical soil erosion, sedimentation, and other resource problems and developing plans of work for those critical areas. Both land owners and the general public would participate in developing the plans of work. Critical areas already identified by the water quality management program (Section 208, PL 92-500) under the established statewide erosion and sediment control legislation and programs, or through the statewide RCA planning process, would qualify as critical areas.

The local board would be encouraged and assisted to develop programs that reflected national priorities and objectives to the extent that problems of national significance existed in the area. It would also be encouraged to emphasize cost-efficient methods for solving resource problems and protecting agricultural productive capacity. It is anticipated that local boards and programs would advocate conservation tillage and other cultural and management practices that met local needs and also contributed to achieving state and national priorities.

State program.--The local programs would be considered in designing the statewide cooperative soil and water conservation program.

At the state level, the Governor would assign primary leadership for the state soil and water conservation program to a state agency. The Governor would also appoint representatives to the State Conservation Coordinating Board from other state agricultural and natural resource agencies. This board would be assisted by a technical committee that included representatives of the USDA conservation agencies. Non-USDA agencies could also be included as appropriate. The technical committee would provide information and assistance to the state board.

The State Conservation Coordinating Board would provide leadership and direction in (1) preparing the state soil and water conservation program; (2) securing the necessary administrative and legislative approval for adoption of the program; and (3) negotiating memoranda of understanding or other appropriate instruments that define cooperative working relationships and roles for developing and implementing a cooperative statewide conservation program.

The state board would inform the Governor of critical resource problems that affected the long-term productive capacity of soil and water resources. It would recommend priorities for local, state, and federal funding. Treatment of high-priority critical areas could begin before the statewide soil and water conservation program was completed. During preparation of the program, these

identified priority areas could be the basis for proposing and negotiating agreements for USDA soil and water conservation matching grant funds.

States would be eligible to apply for USDA soil and water conservation matching grants when they could identify high-priority problems, when they could show that they could solve these problems in a cost-efficient manner, and when state or local funds were available for use in connection with the USDA grants. The proportion of USDA funds to state and local funds would vary depending on the problems to be addressed, the potential effectiveness of plans for dealing with the problems, and the ability of the state or local government to pay. These variable-rate conditions would be negotiated and reflected in an agreement between the Governor and the Secretary of Agriculture.

USDA Soil and Water Conservation Program

The USDA program would establish for the first time clear objectives, priorities, and action plans for addressing national needs for soil and water conservation in a timely and cost-efficient manner. The Secretary would appoint a National Conservation Board from recommendations made by the governors. This board would provide advice and recommendations to the Secretary on the implementation of the USDA conservation program. It would also review and recommend action on requests from states for matching grants.

Existing USDA programs would continue to the extent that they were funded. The regulations and procedures for administering these programs would be modified as needed to meet the needs and priorities identified in the statewide conservation programs.

SCS would have the lead USDA responsibility for monitoring progress and evaluating the effectiveness of the cooperative local-state-federal program. Other participating agencies would provide needed information and assist in evaluating findings. Their views, if different from those of SCS, would be included in the evaluation reports.

Matching Grants to States

USDA soil and water conservation grants to states would encourage local and state governments to assume a more active role in soil and water conservation programs. Grants to states would augment local or state funding for soil and water conservation programs.

States with existing soil and water conservation programs that met the requirements for a cooperative local-state-federal conservation program would be eligible for USDA grants to the extent that their programs would contribute to achieving high-priority objectives.

The total federal variable-rate matching grant funds in the initial years probably would be $50 to $100 million, depending on state participation. States that have established similar programs limited the funding from $0.5 to $3.0 million in the early years, probably because of limited resources, administrative problems in getting a new program under way, and the need to acquire experience to determine need and demand or effectiveness. A few states

with programs that have lasted have increased funding. Iowa, for example, currently funds its cost-share program at $5 million. A "grandfather" clause would make states with existing cost-share programs eligible immediately for matching grants.

The USDA funds available for matching grants would be distributed on the basis of an agreement developed between each Governor and the Secretary of Agriculture. The agreement would specify the extended use and the proportion of local and state funds that would be provided for their share of the program effort.

Matching grant funds would be used primarily for additional technical assistance or financial incentives to land owners who planned and applied conservation methods in their agricultural operations. When the agreement so specified, states could use USDA matching grant funds to revise and update conservation programs, to conduct pilot projects, or for other purposes that led to meeting the objectives identified in the agreement.

Administration of matching grants.--States would apply for USDA soil and water conservation grants after they had identified high-priority conservation problems and if they were ready to provide more program assistance in the high-priority areas. Grants would be most acceptable at the local and state level if they were "new money" reflecting a higher national priority for soil and water conservation. Nonetheless, options for grants were also considered at the level and lower bound funding scenarios. Some increase in accomplishments is possible at level funding, depending on how willing local and state governments are to expand their activity with little change in USDA programs. The potential for increased local and state participation at reduced USDA funding is speculative and unlikely to result in much change during the 5-year program period.

Grant funds would be managed and administered by the responsible state agency as designated by the Governor or in state legislation. There would be latitude for states to authorize the administration of grant funds at the local level subject to rules and procedures adopted by the state.

The Local Conservation Coordinating Board would receive, review, and approve or reject applications for assistance in treating problems in designated high-priority resource problem areas. Local boards would be encouraged to use long-term agreements for technical and financial assistance as an incentive for installing conservation systems. With the cooperation and assistance of the local SCS and ASCS representatives, the local board would approve a land owner's implementation plan and establish priorities for technical and financial assistance.

States could use part of the USDA matching grants for equity capital as leverage to attract more private monies for use in low-interest loans to install conservation practices. Funds could be used in this manner if the agreement so specified.

Pilot Projects

States and USDA agencies would have the latitude to evaluate actions needed to deal more effectively with persistent conservation problems or to test

potential solutions to new problems. Pilot projects could be proposed as elements of a state plan or as cooperative projects of local, state, and USDA agencies. They would be established and monitored during the first 5-year period to provide guidance for subsequent program development. Pilot projects could be established in various areas throughout the country to study their comparative effectiveness under different natural resource, agricultural, and institutional settings. They could be designed to test new ideas or approaches and explore alternative incentives and delivery systems.

Examples of the pilot tests that could be implemented and evaluated follow:

- o Conservation incentives. The effectiveness of different types of conservation incentives in solving priority problems could be tested. The pilot tests would evaluate land users' responses to incentives as well as the net economic impact of each incentive.

- o Conservation performance payments. Payments could be made to farmers who voluntarily agreed to take measures to reduce excessive soil loss by cultural means. Farmers would receive a lump sum cash payment for such actions and would be free to use those products of the land that could be removed without causing excessive erosion. The pilot tests could experiment with annual payments and with long-term contractual arrangements.

- o Conservation easements and diversion payments. The purchase of conservation easements from a land user could be tested. Purchase of easements would end the use as cropland of land prone to excessive erosion. Easements would be purchased by a state or local agency but would be partly funded by a USDA grant. Or, if the land did not need to be retired indefinitely from crop production but only diverted temporarily, the farmer could receive a diversion payment.

- o Bonuses as an incentive for cross-compliance.--The feasibility of giving increased program benefits to operators who conformed to "acceptable" resource management options while participating in other USDA farm programs could be tested. This approach, when earlier proposed, was known as the "Green Ticket." These projects would be limited to specific geographic areas where erosion is a significant problem, where participation in USDA commodity and production adjustment programs is high, and where there is local interest in this approach. The incentives offered could be marginally higher target prices or income support payments. Tests of this approach would include evaluations of procedures for performance, certification, and appeals.

- o Low-interest loans. The use of loans could be tested. USDA would provide low-interest or interest-free loans to land owners who installed cost-efficient conservation practices that were particularly effective on lands with excessive erosion. Repayment periods would be commensurate with the life of the practices.

- o Tax incentives. USDA could work with the Treasury Department and selected states to evaluate economic conditions and characteristics of ownership where expanded use of tax deductions, credits, or income exclusions could effectively encourage investment in conservation practices. "Simulated" tax incentives are particularly well adapted for pilot testing.

Successful pilot tests could result in modification of programs or procedures or might result in legislative proposals.

Conservation Plans for FmHA Loans

The eligibility requirements for Farmers Home Administration (FmHA) loans could be modified to help in achieving USDA conservation objectives. Program policies would begin to require a conservation plan on property for which farm ownership and soil and water loans were requested.

Prospective borrowers could be provided technical assistance to prepare a conservation plan consistent with locally adopted conservation standards. These plans would be reviewed and have the concurrence of the local conservation district prior to approval of a loan. Loan applicants who did not have an existing plan would be considered to have met this qualification requirement once they applied to their local conservation district. Borrowers would be encouraged to apply and maintain the conservation system in accordance with their conservation plan.

Locally adopted standards.--Specifications for acceptable resource management systems would be developed by the Local Conservation Coordinating Board, or jointly by the local conservation district and county ASC committee in the absence of such a board. Local representatives of state and USDA resource agencies would provide information and assistance as appropriate. The SCS Technical Guide and state conservation practices acts, where they existed, would be the principal sources for determining acceptable resource management systems.

A state committee composed of state level representatives of the agencies on the National Committee plus the State Soil and Water Conservation Agency and State Agricultural Experiment Station would develop guidelines and procedures for use at the county level in each state.

National guidelines and procedures, if needed, would be developed by a USDA Committee consisting of representatives of the Agricultural Stabilization and Conservation Service, Agricultural Research Service, Cooperative State Research Service, Economic Research Service, Extension Service, Farmers Home Administration, Forest Service, and Soil Conservation Service.

Other program assistance.--Loan applicants could request technical assistance from USDA or state agencies in developing a conservation plan to meet eligibility requirements for a loan. Borrowers could elect to apply for USDA, local, and state conservation program assistance to apply the resource management systems necessary to maintain their eligibility for the FmHA loan programs.

Certification procedures.--The local conservation district or SCS technician could certify that a loan applicant had an approved conservation plan. Status of plan implementation would be determined during reviews of the applicant's loan.

Effectiveness of conservation standards for FmHA loans. Adoption of this feature would make producers ineligible for further FmHA loans if they exploited their resources. It is expected that potential borrowers would

increase their demands for technical assistance to prepare conservation plans required to be eligible for loans. It is also expected that borrowers would seek assistance from USDA or other technical assistance and cost-share programs to implement their plans. This would require SCS, ASCS, and perhaps states to place new priorities among and within states to service the most pressing demands. No data are available for use in projecting the percentage of borrowers who have excessive erosion or other problems that affect the long-term productive capacity of their resources. This requirement would demonstrate that the federal government expects responsible stewardship from owners and operators of farms and ranches in return for assistance through federal programs.

State and local response. This program feature would complement and be supportive of initiatives to solve conservation problems at the local and state levels.

The public comments on the draft program report that was distributed for review in early 1980 indicate that this feature could be controversial. Forty-nine percent of the comments on the cross-compliance alternative strategy described in that report supported it, and 51 percent opposed it. However, 60 percent of the comments indicated that the respondents thought it would be effective. The Louis Harris and Associates, Inc., Poll found that 75 percent of those surveyed believed that USDA should not provide other program benefits to farmers who do not properly care for and protect soil and water resources. These people also insist that there must be equity between the private and public costs and benefits in satisfying this condition.

In general, FmHA borrowers have limited resources and operate smaller than average units. They may find it difficult to comply with an added eligibility requirement for adoption of acceptable conservation standards even when it would be in their long-term interest to do so.

Program costs and manpower.--There is no basis for a reliable estimate of the costs and manpower requirements of implementing this requirement. It is assumed that demands for technical assistance and cost sharing will increase for the 20,000 new borrowers each year. Demand for conservation planning assistance could increase by 250 to 400 staff-years annually. Additional staff capability would be needed to provide technical assistance and to cover the increased administrative requirements related to installation and maintenance of resource management systems. The workload for application would expand annually until an equilibrium between new participants and loan redemptions existed.

Impact on program administration and institutions.--This feature would result in increased compatibility between USDA loan programs and conservation objectives. It would require a free exchange of information and cooperation among FmHA, SCS, and ASCS in establishing priorities. The conservation programs of state and local resource agencies would be affected. There is no assurance that FmHA loan applicants would be located in priority problem areas.

Political and legislative considerations. Some agribusiness interests could be expected to oppose this feature because of the constraints it would place on potential customers. If FmHA borrowers were given a high priority for

assistance from other programs, it could be viewed as preferential treatment. The Secretary already has the authority to initiate this eligibility requirement by revising the administrative regulations for FmHA loans.

Distributional effects.--Adoption of this requirement for FmHA loan participants could increase the short-term operating costs of borrowers. This increase could be offset by long-term benefits in maintaining or improving soil productivity. Major adjustments could be needed for operators with serious resource problems. It would expose operators who exploited their resources and those situations where a proposed loan could adversely affect the future productive capacity of resources. The general effects would be negligible.

Small farmers could find it more difficult to comply with this provision without increased financial assistance.

Tax Incentives

Reductions in federal income taxes for land owners and operators who conserved the soil could be provided through special tax incentives. Section 175 of the Internal Revenue Code of 1954 allows qualifying farm owners and operators to treat soil conservation expenditures on the land as expenses deductible in the year that they are incurred, rather than as merely capital improvements to land. To qualify, the taxpayer must be "engaged in the business of farming." Thus, only active farmers are eligible. Cash-rental landlords who improve their land for conservation purposes are not eligible for this deduction. The limit for this deduction is 25 percent of the gross income received from farming during the tax year.

The most recent data available, for 1977, show that in that year 115,000 farmers reported conservation expenses totalling $93.6 million. This number represented less than 5 percent of all taxpayers who filed Schedule F Farm Tax Returns.

Several members of Congress have introduced legislation in the current session (97th Congress, First Session) to allow direct tax credits for soil conservation as an alternative to the expense deduction allowed in Section 175.

The first such legislation was introduced on February 24, 1981. S.569 was sponsored by Senator Jepsen of Iowa and co-sponsored by Senator Heflin of Alabama, the chairman and ranking minority member, respectively, of the Senate Agricultural Committee's Subcommittee on Soil and Water Conservation. A companion bill in the House of Representatives, H.R. 2515, was introduced by Representative Evans of Iowa. Under this legislation, the taxpayer--who could be either a working farmer or a cash-rental landlord--could take a 10 percent tax credit instead of treating the expenditure as an expense. This legislation would provide a broader incentive for soil conservation for two reasons. First, unlike existing Section 175, an incentive would be available to the cash-rental landlord as well as to the working farmer. Second, the credit taken against tax liability would be a more valuable tax incentive than the deduction in existing law is to the many farm owners who have tax liability but are in low tax brackets.

Senator Grassley of Iowa, on July 31, 1981, introduced S.1561. This bill would provide a tax credit equal to 20 percent of soil conservation expenditures made during the tax year. This bill broadens the definition of soil conservation measures eligible for the tax credit to include any amount paid and incurred "for purposes of soil conservation, prevention of soil erosion, or the reduction or control of agriculture-related pollution." It also includes the type of land improvements to which the existing Section 175 deduction is limited.

Finally, Representative Tauke of Iowa, on August 4, 1981, introduced H.R. 4411. It is co-sponsored by four other Representatives: Beilenson of California, Erdahl of Minnesota, Neal of North Carolina, and Railsback of Illinois. H.R. 4411 would allow taxpayers "engaged in the trade or business of farming" a specified tax credit per acre of cropland on which a farmer practiced conservation tillage. The annual credit would be $10 an acre for the first 200 acres, $8 an acre for the next 200 acres, and $5 an acre for any additional acres.

While the incentives in all of these pending bills would appear to be inducements for farmers and land owners to practice conservation, a major limitation to the effectiveness of tax incentives, whether deductions or credits, is that the taxpayer must first have a tax liability in order to benefit. When expenditures charged as conservation expenses were analyzed in 1968, the data showed that 1.2 million farm proprietors (39 percent) reported net losses. Of the more than 190,000 farmers who claimed conservation deductions, 36 percent reported net losses.

Data from the 1978 Resource Economic Survey indicate that proportionally more farmland owners with high incomes, especially high nonfarm incomes, already invest in conservation measures. If a significant target group for tax incentives, namely higher income farmers, already make these investments, it could be asked whether tax incentives to this group are as necessary to promote soil conservation as are other measures reaching a broader income class of farmers, such as cost sharing.

In general, incentives are effective in targeting conservation investments to erosion problems when a strong positive relationship exists between operator income and farmland erodibility. Land owners with high net farm income (more than $15,000) own more than their proportionate share (20.9 percent) of cropland needing erosion control. Slightly more than one-third (35.4 percent of the cropland needing erosion control is owned by those whose combined farm and nonfarm income is more than $15,000. These patterns are relatively consistent across farm production regions.

It would appear from these relationships that some modification of the current tax laws could provide additional incentives for conservation investments that reduce soil erosion. These adjustments could extend tax benefits to cash rental landlords and farm operators who invest in equipment needed to install or maintain conservation management systems such as conservation tillage, which requires some new, specialized farm equipment. Tax incentives could also increase conservation application where direct incentives for installing practices are limited or not available. Tax incentives would require further study before legislation was proposed. A simulated test of tax incentives would not require legislation, and is proposed as a pilot project on page 6-23, above.

Intergovernmental Cooperation

Existing USDA and state soil and water conservation programs would continue to operate under current procedures. The regulations, rules, and procedures would be modified to require consideration of the needs and priorities identified in the state conservation program and in their local counterparts. Closer coordination and cooperation among ASCS, SCS, and other USDA resource conservation agencies would be essential at the federal, state, and local levels. SCS would be available to provide technical staff support to the local and state efforts for a cooperative program. SCS assistance could take the form of direct technical support or grants to states and conservation districts to employ permanent professional staff.

USDA program coordination would be strengthened by the establishment of a policy level committee to oversee the budget formulation and agency action plans as described in alternative 2.

Monitoring and Evaluation

USDA would monitor the application of resource management systems, evaluate the amount of reduction of soil erosion and sedimentation, and assess the improvements in agricultural productivity, water quality, and other social values. Other federal agencies and state and local cooperating agencies could provide advice and technical assistance.

Evaluation reports would contain recommendations for revising programs where the installed treatment measures are not cost-efficient in reducing erosion and sedimentation or addressing other problems.

Legislation Needed

The authority already exists for USDA to establish priorities, increase program emphasis on critical areas, and increase coordination and cooperation among USDA agencies. Once a program is selected, it would be appropriate to consider a legislative proposal that would provide for its implementation as a package.

Federal legislation would be necessary or desirable for implementing the following components:

- Provision for Local and State Conservation Coordinating Boards; recognition of local and state conservation programs as instruments for achieving national conservation objectives and priorities; use of variable-rate matching grants to states for technical or financial assistance to implement state and local programs; and federal recognition of local conservation standards adopted in response to state conservation practices acts in states that enact such legislation.

- Definition of the organizational and institutional arrangements for implementing a cooperative local, state, and federal conservation program, including formal agreements between the Secretary and state governors.

- Authority to conduct pilot studies to test new ideas, provide more effective solutions to problems, or address new issues.

- Increased tax incentives for achieving conservation objectives.

- Provision for an expanded role for and increased participation of local and state governments in a cooperative conservation program.

Legislation would also be needed or desirable at the state level for the following components. The precise needs would vary among states.

- Provision for the preparation of local and state soil and water conservation programs that are based on appraisal of conditions, projection of resource needs, and identification of priorities. These programs could be developed in conjunction with state conservation practices acts such as the ones that Iowa, Illinois, and other states have already enacted.

- Authority for the Governor to negotiate cooperative agreements with the Secretary of Agriculture for use in the development and implementation of state conservation programs.

- Authority to develop a program and designate responsibility to provide state technical or financial assistance to land owners and operators in planning and applying conservation systems that meet local standards consistent with state guidelines.

- Monitoring, evaluation, and periodic updating of local and state programs.

- Funding and authorization for participation in a cooperative local, state, and federal conservation program.

Summary of Effects

Adoption of alternative 3 would have the following effects by the fifth year:

- It is estimated that gross annual soil erosion would be 340 million tons less than under alternative 1 at level funding, 500 million tons less at upper bound funding, and about the same at lower bound funding.

- The analysis indicates that 135 million acres of cropland would be eroding at rates in excess of 5 tons per acre if alternative 1 were adopted. This acreage would be reduced to an estimated 126, 121, and 131 million acres, respectively, at level, upper bound, and lower bound funding.

- Upstream flood damages would be reduced; compared with current trends, by $5.0 million at level funding, by $9.0 million at upper bound funding, and by $2.0 million at lower bound funding.

- Annual sediment loading in streams, lakes, and rivers would be reduced by about 34 million tons at level funding, by 40 million tons at upper

bound funding, and by 25 million tons at lower bound funding for alternative 3. This compares to an estimate of 12 million tons if alternative 1 were implemented.

No significant change in annual savings of water for agriculture as a result of federal action could be expected under alternative 3 because of the emphasis on erosion control and upstream flood damage reduction. Private efforts, however, would be expected to continue and to result in some water conservation.

Even at upper bound funding, alternative 3 would not approach nondegradation of the Nation's resources. Excessive erosion would continue to lower the long-term productivity of some nonfederal agricultural lands. However, the 1985 RCA appraisal and program update would measure progress and assess resource problems and prospects. At that time, USDA could adjust programs and priorities.

State and local response.--Alternative 3 would offer local and state governments a clear leadership role in controlling soil erosion and sedimentation. USDA programs and priorities would be influenced by the comprehensive state programs that were developed from locally developed programs and priorities. Alternative 3 proposes stronger USDA financial support through a new matching grant program for control of erosion and sedimentation on agricultural land with critical erosion problems. Alternative 3 would also permit targeting of financial assistance to those areas. It builds on the existing institutional structure at the local and state levels and provides for closer coordination of soil and water conservation efforts. Alternative 3 is a major step toward increased effectiveness and efficiency in soil and water conservation. The USDA emphasis is on cooperation, voluntary participation, and strengthened mutual support. The state and local response should be positive and constructive.

Public acceptance.--In the survey conducted by Louis Harris and Associates, Inc., a majority of those sampled said that the federal government had a role in and should assume part of the responsibility for conservation of soil and water resources. However, this federal role was perceived as a partnership with state and local governments and with land owners and users. Of the comments on the 1980 RCA draft documents that addressed the state role, 51 percent favored and 49 percent opposed state leadership for soil and water conservation programs. As in the Harris survey, a significant number of comments supported a federal partnership role in those programs.

Impact on existing institutions.--Implementation of alternative 3 would mean that existing institutional arrangements would provide the basis for future conservation programs but that the role of state and local governments in conservation program planning and priority setting would be strengthened. Coordination among state and USDA programs would also be strengthened. All USDA and state programs for controlling erosion and reducing sedimentation would be operated according to a statewide cooperative soil and water conservation program. The flexibility of USDA and state agencies in the assignment of personnel and allocation of money would be reduced because new resources would be targeted to critical areas. Some adjustment in allocation of these resources among counties within states might also occur. Integrating

other federal and state authorities such as the EPA water quality management program (Section 208) and state erosion and sediment control programs could produce efficiencies in achieving related federal and state objectives.

Political and legislative considerations.--The intent and purpose of alternative 3 should have widespread support. The alternative is built on local participation. If any regulatory features were included, nearly all would come from initiatives of state government.

Major shifts in the allocation of funds and technical assistance to targeted areas, especially between states for existing programs such as ACP, GPCP, or SCS technical assistance, could generate some complaints. Within states, the leadership and participation of state and local governments in program development should minimize such complaints and might even lead to more optimal allocations within states. The greater involvement of state and local governments, however, could cause some disruption of longstanding federal program arrangements and levels of activity in some localities and states. Legislation would be required to authorize matching grants.

Program costs and staffing.--Table 6-4 shows how available federal funds would be spent if local and state governments took a stronger role in conservation programs. Table 6-5 shows how the percentage distribution of funding would change under the different funding scenarios.

o Level funding scenario.--Redirection of programs to priority objectives and targeted areas would cause some adjustment in the use of funds and staffing patterns. Funding for direct technical assistance would be augmented by grants that would be matched by states. By the fifth year, total funding for technical assistance would be about 16 percent above funding in the base year, in constant dollars. USDA funds for direct cost-share programs would be reduced by about 3 percent by the fifth year. This reduction would be offset by $105 million in grants that states would match to carry out state cost-share programs. Thus, the net impact by the fifth year would be a net increase of almost 24 percent for the combined USDA and state cost-share programs. Funding for research, technology development, and education would be increased. These funding increases would support the development and transfer of technology designed to solve high-priority problems.

o Upper bound funding scenario.--About $175 million would be available for technical and financial assistance grants and loans by the fifth year. These grants would be augmented by matching funds provided by state or local governments. Thus, total program funding could be as high as $1.1 billion by the fifth year, depending on the extent of state matching funds.

USDA funding for education, research and technology development, and data collection and analysis would increase. Total funding for technical and financial assistance would increase significantly if state and local governments responded favorably.

Total USDA staffing would remain at about current levels, but major shifts in the location and activities of staff would occur. Location of targeted areas addressing high priority objectives and increased emphasis on education, research, and data collection and analysis would influence those shifts.

o Lower bound funding scenario.--Direct technical assistance provided by USDA would be reduced by 12 percent from current levels by the fifth year. This reduction could be partly offset by grants for technical assistance. The recipient states would match these grants. Thus, the real reduction in technical assistance capability by the fifth year would be about 9 percent in constant dollars.

USDA's direct cost-sharing funds would be reduced by about 21 percent, in constant dollars, by the fifth year. This reduction would be partly offset by the grants to be matched by receiving states. Funding for research, technology development, and education would be reduced by 3 percent compounded annually. The net result would be a declining USDA capability to carry out a national soil and water conservation program.

Depending on state and local response, increased demand for and conversion of agricultural land to nonagricultural uses would tend to offset accomplishments in solving soil and water conservation problems. Some program elements would be eliminated. USDA staffing for soil and water conservation programs would be reduced by about 5 percent by the fifth year.

Distributional effects.--The larger land owners and operators in critical areas would probably respond most favorably to alternative 3. Where erosion control could be achieved with conservation tillage, the cost of production could be lowered. Long-term benefits to the land owners and operators would be the maintenance of soil productivity and associated lower costs of production. Lower costs of production and higher yields resulting from reduction of critical erosion on agricultural lands significantly below current trends should lower long-term prices to consumers.

Tables 6-6 and 6-7 show projections of funding and effects for each of the USDA soil and water conservation programs for the first five years of each of the three alternatives at each funding level. Table 6-6 displays the projected consequences on the major RCA objectives. Table 6-7 shows the projected distribution of soil and water conservation program funds among resource problem areas.

Table 6-8 compares major features of alternatives 1, 2, and 3.

Table 6-4.--Projected fifth-year distribution of funds among major components, alternatives 1, 2, and 3

[All figures are in constant 1979 dollars rounded to the nearest million.]

Major Component	Alternative 1		Alternative 2			Alternative 3		
	1981 (Base year)	Current trends continued	Level funding	Upper bound	Lower bound	Level funding 1/	Upper bound 2/	Lower bound 3/
1. Technical assistance----	198	198	219	225	185	211	212	185
2. Financial assistance:								
a. Cost shares to operators----------	278	167	261	328	209	164	166	179
b. For project activities----------	177	161	167	211	134	167	211	134
c. Total financial assistance----------	(455)	(328)	(428)	(539)	(343)	(331)	(377)	(313)
3. USDA matching funds-----	--	--	--	--	--	105	175	30
4. Education/Information (Extension Service)-----	12	14	14	15	10	14	15	10
5. Research and technology development----------	74	76	80	88	71	80	88	71
6. Data collection and analysis----------	81	86	79	87	72	79	87	72
7. Emergency programs 4/---	17	17	17	17	17	17	17	17
TOTAL 5/----------	837	719	837	971	698	837	971	698
Loans----------	(77)	(50)	(72)	(80)	(60)	(72)	(82)	(60)

1/, 2/, and 3/ Includes $105, $175, and $30 million, respectively, for grants for technical assistance, financial assistance and loans.

4/ Held constant because emergencies cannot be predicted.

5/ Total funds were projected using a linear regression method separately from the individual components. The latter were then adjusted to fit the total.

Table 6-5.--Projected fifth-year percentage distribution of funds among major components, alternatives 1, 2, and 3

Major Component	Alternative 1		Alternative 2			Alternative 3		
	1981 Base Year	Current trends continued	Level funding	Upper bound	Lower obund	Level funding	Upper bound	Lower bound
1. Technical assistance---	23.7	27.5	26.2	23.2	26.5	25.3	21.8	26.5
2. Financial assistance:								
a. Cost shares to operators----------	33.2	23.2	31.2	33.8	29.9	19.6	17.2	25.6
b. For project activities---------	21.2	22.4	19.9	21.7	19.3	19.9	21.7	19.3
c. Total financial assistance---------	(54.4)	(45.6)	(51.1)	(55.5)	(49.2)	(39.5)	(38.9)	(44.9)
3. USDA matching funds----	--	--	--	--	--	12.5	18.0	4.3
4. Education/Information (Extension Service)----	1.4	1.9	1.7	1.5	1.4	1.7	1.5	1.4
5. Research and technology development----------	8.8	10.6	9.6	9.1	10.2	9.6	9.1	10.2
6. Data collection and analysis----------	9.7	12.0	9.4	9.0	10.3	9.4	9.0	10.3
7. Emergency programs 1/--	2.0	2.4	2.0	1.7	2.4	2.0	1.7	2.4
TOTAL----------	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total Dollars (Millions)--	(837)	(719)	(837)	(971)	(698)	(837)	(971)	(698)

1/ Held constant because emergencies cannot be predicted.

Table 6-6.--Projected consequences of alternative programs on selected indicators by the fifth year

Indicator	Unit of Measure	1977	Alternative 1	Alternative 2			Alternative 3		
			Current trend	Level	Upper bound	Lower bound	Level	Upper bound	Lower bound
1. Reduce erosion:									
a. Annual reduction in gross erosion--	Million tons	-	79	119	143	95	123	150	95
b. Gross erosion------	Billion tons	5.33	4.81	4.51	4.39	4.72	4.47	4.31	4.72
2. Reduce cropland acreage eroding excessively:									
a. Annual reduction in cropland acres eroding at , 5 tons per acre per year--	Million acres	-	0.5	2.5	3.5	1.5	2.5	4.0	1.5
b. Cropland acres eroding at , 5 tons per acre per year--	Million acres	141	135	126	121	131	126	118	131
3. Reduce upstream flood damages:									
a. Annual reduction in upstream flood damages----------	Millions of dollars	-	2.6	3.3	3.9	2.9	3.6	4.4	2.9
b. Upstream flood damages----------	Millions of dollars	1,805	1,782	1,778	1,775	1,780	1,777	1,773	1,780
4. Reduce net water depletions to achieve water conservation:									
a. Annual reduction in water depletions---	millions of acre-feet	-	0.02	0.02	0.02	0.02	0.02	0.02	0.02
b. Water depletions---	millions of acre-feet	86.6	86.4	86.4	86.4	86.4	86.4	86.4	86.4
5. Reduce sediment loading from agricultural sources:									
a. Annual reduction in sediment loading---	Million tons	-	26	39	47	31	40	49	31
b. Sediment loading---	Billion tons	1.76	1.64	1.47	1.43	1.51	1.42	1.36	1.51

Table 6-7.--Projected fifth-year percentage distribution of funds among resource problems, alternatives 1, 2, and 3

Major resource problems	Alternative 1		Alternative 2			Alternative 3		
	1981 (Base year)	Current trends continued	Level funding	Upper bound	Lower bound	Level funding	Upper bound	Lower bound
1. Soil resources	30.5	30	38	39	36	38	39	36
2. Upstream flood damages	13.1	15	16	16	16	16	16	16
3. Rural community and urban resource conservation	25.5	24	22	22	21	22	22	21
4. Water quality	13.2	13	11	11	12	11	11	12
5. Water conservation	10.7	11	9	8	10	9	8	10
6. Fish and wildlife habitat	3.7	4	3	3	3	3	3	3
7. Energy conservation	1.9	2	1	1	1	1	1	1
8. Organic waste management	1.4	1	1	1	1	1	1	1
Total	100.0	100	100	100	100	100	100	100

Table 6-8.--Features of alternatives 1, 2, and 3 under the different funding levels

X = feature present 0 = feature absent
XX = increased emphasis d = decreased emphasis
XXX = major emphasis

Feature	1 Continue Current Trends	2 Level	2 Upper	2 Lower	3 Level	3 Upper	3 Lower
A. USDA CONSERVATION OBJECTIVES THROUGH THE YEAR 2030:							
1. Reduce erosion to the rate at which soil productivity can be maintained.	0	XX	XX	X	XX	XX	X
2. Reduce flood damages in upstream watershed areas to the most practical and cost-efficient level by concentrating efforts where floods pose the greatest threat to human life, agricultural lands, and property.	0	XX	XX	X	XX	XX	X
3. Improve rangeland presently in poor or fair condition to at least good condition.	0	X	XX	X	X	XX	X
4. Increase the efficiency of using irrigation water both on and off the farm to the highest practical and cost-efficient level.	0	X	XX	X	X	XX	X
5. Reduce nonpoint pollution of water and enhance water quality through the support of state and local governmental initiatives.	X	X	XX	X	X	XX	X
6. Increase water supplies and solve other water resource problems through continuation of present efforts.	X	X	X	d	X	X	X
7. Help retain prime farm lands in agricultural uses through support for state and local governmental initiatives.	X	X	X	X	X	X	X
B. PRIORITIES FOR USDA CONSERVATION ACTION THROUGH 1985:							
1. Highest priority: Reduce erosion on U.S. agricultural lands.	0	X	XX	X	XX	XXX	X
2. High priority: Reduce flood damages in upstream areas.	0	X	XX	X	XX	XX	X
3. Medium priority: Improve water quality, water conservation and supply, and community related conservation activities.	0	X	X	d	X	X	d
4. Lesser priority: Improve fish and wildlife habitat and organic waste utilization.	0	d	X	d	d	X	d

Table 6-8.--Features of alternatives 1, 2, and 3 under the different funding levels--Continued

Feature	1 Continue Current Trends	2 Level	2 Upper	2 Lower	3 Level	3 Upper	3 Lower
C. DEVELOPING CONSERVATION PROGRAMS:							
1. Provide for local joint decisionmaking among the conservation district, county ASC committee, and other interested parties, in identifying critical resource problem areas, setting priorities for action, and developing the local conservation program. Make the local conservation program the key building block for state and national conservation programs.	O	O	O	O	X	X	X
2. Provide for joint decisionmaking among state soil conservation agency, USDA state-level offices, and other interested parties, in identifying state critical resource problem areas, setting priorities for action, and developing the state conservation program, taking local conservation programs into account.	O	O	O	O	X	X	X
3. Establish a USDA National Conservation Board to advise the Secretary of Agriculture on conservation matters and national critical resource problem areas, and to recommend national conservation priorities.	O	O	O	O	X	X	X
4. Use the program prepared by the state as the basis for an agreement between the Governor and the Secretary of Agriculture, outlining conservation actions to be taken cooperatively.	O	O	O	O	X	X	X
5. With advice of the USDA National Conservation Board, the Secretary of Agriculture sets national conservation priorities and develops the national conservation program, taking state and local conservation programs into account.	O	O	O	O	X	X	X
6. Achieve closer budget coordination among USDA agencies with conservation program responsibilities.	O	X	X	X	X	X	X
D. USDA PROGRAM ACTIONS THROUGH 1985:							
1. Target a larger share of available USDA conservation funds and personnel to critical areas where erosion threatens the long-term productive capacity of the soil.	O	X	XX	X	XX	XXX	X
2. Emphasize conservation measures, such as minimum tillage, that are most cost efficient in reducing erosion.	O	X	XX	X	XX	XX	X
3. Concentrate efforts to reduce flood damages to areas with high total damages to human life, agricultural lands and property.	O	X	XX	X	X	XX	X

Table 6-8.--Features of alternatives 1, 2, and 3 under the different funding levels--Continued

	Feature	1 Continue Current Trends	2 Level	2 Upper	2 Lower	3 Level	3 Upper	3 Lower
4.	Provide variable-rate USDA grants to states for financial and technical assistance to carry out state and/or local activities in critical resource problem areas of national significance.	0	0	0	0	XX	XXX	0
5.	Support states that enact laws that assure treatment of critical resource problem areas in accordance with locally determined conservation standards.	0	0	0	0	X	X	X
6.	Strengthen tax incentives, such as federal tax credit for investments in conservation practices or accelerated depreciation of capital investments for installing conservation measures.	0	X	X	X	X	X	X
7.	Give priority to providing technical assistance to farmers and ranchers for planning and installing conservation systems.	d	X	XX	X	X	XX	X
8.	Increase the proportion of total USDA conservation funds used for sharing with farmers and ranchers the costs of installing conservation practices.	d	X	X	0	X	XX	0
9.	Increase the availability of low-interest USDA loans for installing conservation systems on farms and ranches.	d	X	XX	d	XX	XXX	X
10.	Target research efforts to solve priority conservation problems.	0	X	XX	X	XX	XXX	X
11.	Target education and information activities for conservation, emphasizing conservation tillage.	0	X	XX	X	XX	XXX	X
12.	Conduct pilot projects to test new conservation strategies.	0	X	X	X	X	X	X
13.	Minimize features of USDA farm programs that limit the achievement of conservation objectives.	0	X	X	X	X	X	X
14.	Strengthen data collection for better analysis of resource conditions and trends.	X	X	X	X	X	X	X
15.	Evaluate conservation programs to determine their effectiveness and efficiency.	X	XX	XXX	XX	XX	XXX	XX
16.	Expand the use of long-term contracts between USDA and farmers and ranchers for financial and technical assistance.	0	X	XX	X	X	XX	XX
17.	Establish the requirement that land owners have a conservation plan in order to be eligible to participate in FmHA loan programs.	0	0	0	0	X	X	X

Table 6-8.--Features of alternatives 1, 2, and 3 under the different funding levels--Continued

Feature	1	2			3		
	Continue Current Trends	Level	Upper	Lower	Level	Upper	Lower
E. PROJECTED ACHIEVEMENT OF REDUCING GROSS EROSION REDUCTION: (1977 CONDITION = 5.33 BILLION TONS/YEAR)							
5th year, erosion (billion tons/year)	4.81	4.51	4.39	4.72	4.47	4.31	4.72
50 years, erosion (billion tons/year)	5.83	4.78	4.24	5.60	4.37	3.83	5.46
F. RESPONSIVENESS TO PROGRAM EVALUATION NEEDS	X		XX			XXX	
G. CONSISTENCY WITH PUBLIC COMMENT	Inconsistent		Consistent			Consistent	

Additional Options Considered

Cross-compliance and state conservation practices acts were fully considered for use with any of the alternatives. Selected elements of these options were adopted in the preferred program.

Cross-Compliance

USDA could improve the consistency with which its farm and conservation programs respond to national soil and water conservation objectives. This could be accomplished in either of two ways: (1) requiring that management of lands with serious resource conservation problems conform with acceptable resource management systems as a condition of eligibility for participating in specified USDA programs, or (2) offering increased benefits from specific programs to land owners or operators who meet acceptable resource management standards. The basic concept of the two methods discussed here is generally referred to as "cross-compliance."

General guidelines for the operation of cross-compliance for acceptable resource management systems would be developed by a national USDA committee. The committee would consist of representatives of agencies that were directly involved in resource program operations or that furnished technical consultation in the development of program criteria and operating procedures at state and local levels. Represented agencies would include the Agricultural Research Service, Agricultural Stabilization and Conservation Service, Cooperative State Research Service, Economic Research Service, Extension Service, Farmers Home Administration, Federal Crop Insurance Corporation, Forest Service, and Soil Conservation Service.

Consistent with the general guidelines developed by the national committee, state committees would develop guidelines and general procedures for use at the county level in each state. The guidelines and procedures would assist responsible parties in achieving desired objectives at the local level while allowing sufficient flexibility to adapt the program to local conditions. State committee membership would include state representatives of agencies that are members of the national committee and representatives of the state soil and water conservation agency and the State Agricultural Experiment Stations.

Specifications for "acceptable" and "unacceptable" resource management systems would be jointly developed by conservation district officials and county ASC committees with technical assistance provided by local representatives of state and USDA resource agencies. No system would be designated as "acceptable" if it resulted in excessive erosion and if alternative management systems that would further reduce erosion on similar lands were available and practical in the community. However, it would not be necessary to achieve T-value if this level of erosion control reduced farm incomes under local conditions. Both the required and voluntary approaches would require procedures for performance measurement, spot-checking certifications, and appeals.

Required conformance.--Integrated program management for erosion reduction probably could be most easily applied to USDA loan programs. It is potentially applicable to price support, commodity, and production adjustment

programs. Achievement of erosion control objectives would not be uniform for all regions of the country because the rate of participation in these programs varies greatly. Based on recent participation rates, a majority of the cropland in principal wheat-producing states would be affected, but only about one-fourth of the cropland in the Eastern Corn Belt, Appalachia, and the Southeast, and limited amounts in the Northeast would be affected.

If adopted, this approach would be applied only to those parts of a farm where conservation standards are not met. Portions of farms in compliance would be eligible for regular farm program benefits.

Effectiveness of cros-compliance.--In order for such integrated program management approaches to be effective in accomplishing conservation objectives, they must provide the short-run financial incentive necessary to stimulate participation among land owners and operators. To minimize their conservation costs, it is expected that land owners and operators would increase their demands for cost-sharing or bonus payments and technical assistance more rapidly than additional resources could be provided to accommodate them. This would require ASCS and SCS to place new priorities in the allocation of ACP and technical assistance both among and within states to meet the most pressing demands under the required conformance approach.

Assuming that this option were based on commodity programs, an RCA analysis estimated that "only about 25 percent of the lands needing conservation practices would be covered by a cross-compliance requirement between USDA's commodity and conservation programs" (3). Furthermore, when demand for agricultural commodities is high, income support programs are reduced or nonexistent. Yet, pressure on the resource base is the greatest. Thus, when the need for conservation measures is greatest, the actual incentives would be smallest. Therefore, if projections of strong demand for agricultural commodities during the 1980's are accurate, the effectiveness of cross-compliance in reducing soil erosion would be limited to years when acreage setasides were required to reduce production.

It is likely that less than half of the Nation's cropland would be affected by a cross-compliance feature if recent participation rates in commodity programs continue. This estimate of the maximum impact is based on an assumption that added costs for erosion reduction would induce more participants to drop out than would be accomplished by new participants entering the program.

State and local response.--Because this option would modify a perceived "right" of land owners and operators to participate selectively in USDA programs, it probably would have only limited support among farm operators. Opposition would vary regionally. An analsyis of the public response to the RCA draft documents indicated that cross-compliance to achieve conservation objectives was opposed by 51 percent of the respondents (4). Opposition among farmers and ranchers was more pronounced, about 63 percent. However, about 60 percent of all respondents said that cross-compliance would be effective. In addition, among the 7,000 citizens surveyed by Harris and Associates, 75 percent stated that farmers who abused the soil should not be eligible to receive benefits of USDA farm programs. Sixty two percent of the farmers surveyed agreed. Any effort to implement this option would probably need to move gradually to ensure adequate support.

Limiting this option to excessively eroding lands would be a step in that direction. A requirement for conformance with acceptable management systems as a requirement for participation in other USDA programs would be more acceptable under the bonus approach than under the mandatory approach.

Specification of acceptable soil conserving resource management systems, certification of compliance, and monitoring would be local functions that would tend to place additional responsibilities on local citizens and federal officials. The certification procedures would increase workloads and expenses of conservation districts and county ASC committees.

Program costs and manpower.--Although there is no basis for a reliable estimate, there would be added administrative and technical assistance costs. The most significant cost increase might result from increased demands for cost-share assistance from land owners and operators who need to comply with acceptable resource management systems. One analysis of cross-compliance concluded: "Requiring farmers to cross-comply, i.e., to meet certain conservation standards to become eligible to participate in supply control and other programs, may be very expensive. Either (a) the rate of participation in voluntary supply control and other programs will be greatly diminished; or (b) the incentives necessary to get farmers to participate in these programs will have to be increased substantially." (2)

These increased demands could exceed funding for the Agricultural Conservation, Great Plains Conservation, Forestry Incentives, and Rural Clean Water Programs. Also, technical assistance and cost-share demands may require geographic reallocation of resources by SCS and ASCS to meet the most pressing national needs for erosion control. If bonuses went primarily to those already in compliance, costs could be very high in relation to benefits unless targeting was implemented or operators of land not in compliance were subject to reduced benefits or were barred from receiving benefits.

Impact on program administration and institutions.--Cross-compliance would closely tie USDA nonconservation programs to conservation objectives and programs. It would require closer coordination at federal, state, and local levels and would increase the complexity of program administration in the early years. A more significant impact would be the reduction of individual USDA agency independence in determining eligibility of applicants or levels of benefits for programs. This problem would be most difficult at the field level, where program decisions would be made.

There may be reduced participation in nonconservation programs, particularly where the most serious erosion problems occur, where the cost of control is high, and where smaller farms are concentrated. Cross-compliance could impede accomplishment of some nonconservation program objectives. However, where increased costs or FCIC premiums preclude profitable operation of lands that are highly erodible and unsuitable for long-run crop production, the net result would be reduction of excessive erosion and protection of residual long-term soil productivity.

Political and legislative considerations.--Land owners and operators and nonconservation program clients, special interest groups, and secondary beneficiaries of USDA programs such as banks and equipment dealers would likely oppose this option to some degree because of the additional con-

straints placed on qualification for USDA program benefits. To the extent that technical and cost-sharing assistance were reallocated, there could be delayed political reaction from clients formerly served by the reallocated resources. New legislative authority may be required to implement this option, particularly under the bonus approach.

Distributional effects.--In the short run, this option would probably result in slightly higher production costs because of the additonal conservation investments, a portion of which could be passed on to consumers in slightly higher food prices. The effects, however, probably would be negligible. As soil productivity was maintained because of soil erosion reduction, the long-run effects on production costs and consumer prices would probably be favorable.

Land owners and operators of small and part-time farms could be excluded from participation in nonconservation programs unless full incentives to cover their costs of adopting acceptable soil conserving resource management systems were provided. Land owners and operators who had limited resources might not have the available capital for their share of the conservation investment.

Regardless of the size of the operation, land owners and operators in the more erodible areas of the country would probably have to make the greatest adjustments in their operations to come into compliance with acceptable soil conserving management systems. Thus, it is expected that participation in nonconservation programs would decline in erosion-prone areas.

State Conservation Practices Acts

Individual land owners and users have a major stake in and responsibility for use of conservation systems to protect the productive capacity of soil, water, and related resources. However, community, state, and national interests are also affected by the manner in which these resources are used. The appraisal of current conditions and trends weighed against projected resource demands for the future reflect the need for stronger efforts to prevent activities that exploit or abuse soil and water resources.

Traditionally, soil and water conservation objectives have been promoted by emphasizing society's long-term responsibilities for resource conservation. Participation in these programs has been voluntary, relying on commitment to a conservation ethic and incentives. It has resulted in major achievements in protecting the resource base. However, traditional programs and approaches appear to be reaching the limits of their effectivenesss in bringing about full achievement of soil and water conservation objectives.

Proscriptions for remedying soil and water conservation problems that go beyond voluntary participation rest most appropriately at the local and state levels. USDA could encourage and support the adoption of state soil and water conservation practices acts. USDA would provide information on soil and water conservation problems and the need to act on them more effectively. Local and state institutions would administer the provisions of such acts. This would provide a means of achieving approved conservation standards where land owners and users do not meet them voluntarily. It could significantly

reduce the time required to attain a stable condition for the remaining agricultural resources and ensure their capacity to meet future needs. The cooperative local-state-federal program would provide an added incentive to states where there is a need to address this issue.

If USDA wanted to further strengthen state conservation practices acts, it could provide for bonus grants to states that enacted such legislation. States could use these grants in establishing procedures for carrying out the law.

Effects.--State conservation practices acts provide a means for remedying those difficult and persistent problems that cannot be solved voluntarily. They avoid inappropriate incursion of the federal government in matters where local and state authorities could protect the public interest. State conservation practices acts that include provisions for adoption of local conservation standards that are technically and economically feasible and strengthen the basis for solving problems by targeting on critical problem areas.

A state with a conservation practices act could be more effective in resource conservation as the cooperative local-state-federal partnership in resource programs is expanded.

Several states have developed legislation in response to needs identified in water quality studies under Section 208 of the Water Quality Act. These laws tend to address problems of erosion and sedimentation where they pose serious problems in maintaining water quality.

State and local response.--This option recognizes and responds to an established trend toward increased use and adoption of state conservation practices acts. Twenty states, including Iowa and Illinois, as well as the Virgin Islands and the District of Columbia adopted some form of a conservation practices act during the 1970's. Six states established soil and water conservation cost-sharing programs during this same period. USDA would provide data and technical advice in response to state requests for assistance.

Relationship to public comments.--Previous public comments strongly supported a partnership among all levels of government in soil and water conservation. The strong preference was that more decisions affecting program implementation be made at the local level. Most respondents believed that land owners and operators have an obligation to protect and conserve resources for mankind as long as there is equity between private and public costs and benefits. Groups opposed to any potential infringements on private property rights could oppose this option. However, passage of conservation practices acts in some states in the 1970's indicate that this opposition is waning in some areas.

Political and legislative considerations.--This option relies on legislative initiatives by state governments.

Program costs and staffing.--This option could have a varied impact on USDA staffing. It could have a major impact on the location and assignments of USDA personnel in response to the demand for assistance to meet approved

conservation standards. If states provided additional staff of their own, demands on USDA staffing could be reduced.

Distributional effects.--The application of state conservation practices acts involves providing program services to operators who need assistance to comply with local standards. Therefore, priority would be given to meeting their needs. Services to operators who seek conservation assistance for purposes other than complying with local standards and alleviating local problems could be reduced, but this would depend on total funding levels.

Increased private costs and investments in practices that maintain long-term productive capacity would push production costs upward in the short term. Long-term public interests, including consumer prices and environmental quality, would be favorably affected by these same initiatives.

Organization for Providing Solutions

The existing arrangement of programs in USDA has evolved over a period of years. Local organizations, including county ASC committees, conservation districts, and extension advisory committees play significant roles in creating public awareness and delivery of USDA program services. USDA conservation programs have therefore tended to reflect individual, local, and state wants and needs but have not emphasized targeted national priorities.

Four options for organizing for soil and water conservation programs within USDA were examined. These options are discussed below.

Retain Present Structure

USDA's present organizational structure provides for elements of the current USDA soil and water conservation program to be dispensed through seven different agencies. These agencies report to and receive policy guidance through five of the seven Under Secretary/Assistant Secretary/Director positions that report to the Secretary.

This organizational structure has been criticized at times from various sources. The issue of organization was mentioned in 4,757 of the 11,856 comments directed to USDA and its agencies in response to the RCA Draft Documents in January-March 1980. Most of the comments indicated that the organization for soil and water conservation programs is satisfactory as now constituted.

Increased Coordination and Cooperation

This option assumes that the Department's present organization is fundamentally sound. It also assumes that improved coordination and cooperation among USDA agencies would result in more effective program delivery.

The primary mission of the agencies would not change. Therefore, no reorganization would be necessary. The Secretary would establish a budget coordination committee that would ensure that the Department's priorities were reflected in the budget proposals for conservation programs. Agency budget proposals would be based on a uniform method of workload analysis, monitoring, and evaluation of performance.

This option is part of alternatives 2 and 3.

Integrated Soil and Water Conservation Program

Another option would be to create a completely new agency, a Soil and Water Conservation Agency. This action would require new legislation. It would require merging the soil and water conservation program components of USDA's other conservation agencies to the new organization.

There are derivations of the integrated program concept that may be feasible and worthy of consideration. Data collection and interpretation, soil and

water conservation grants and cost sharing, soil and water conservation research and technology development, and conservation technical assistance programs are closely related and should reflect uniform policies, technical capability, and administrative procedures. A partial integration of USDA programs within a single agency would satisfy many critics of the present structure. This partial integration could begin with a merging of technical and financial assistance with date gathering and interpretation. Then, research and technology development could be integrated. It is unlikely that an incremental approach would go beyond this level. Education and information, loans, and Forest Service programs would remain as they are.

The potential for improved services and increased effectiveness from the integrated program concept is sufficient to merit further study and analysis. However, the institutional and political implications are complex and far-reaching enough to require additional evaluation.

Reassignment of Agency Roles by Function

This strategy envisions a reassignment of the various soil and water conservation functions among existing USDA agencies. Each agency would specialize in the function or functions assigned to it.

The concept of functional assignment offers some potential improvements over the current structure. It is not an "all-or-nothing" decision, and timing is not a critical factor. This option deserves continuing study after preparation of the recommended RCA program.

Conclusion

The existing organizational structure can be made more effective and responsive to national priorities and problems. The potential benefits of strengthening the current organizational structure by improved coordination and increased cooperation outweigh the long-term negative effects of continuing the current arrangement. No organizational changes are proposed at this time.

References

(1) Fischer, Victor; John Boyle; Mark Schulman; and Michael Bucuvalas Inc. 1980. A Survey of the Public's Attitudes Toward Soil, Water, and Renewable Resources Conservation Policy. Louis Harris and Associates, Inc. Study No. 792802.

(2) Skold, Melvin D. 1979. Cross-Compliance. Department of Economics, Colorado State University, Fort Collins, Colorado. (Unpublished paper)

(3) United States Department of Agriculture. 1980. Program Report and Environmental Impact Statement. Soil and Water Resources Conservation Act. (Review draft)

(4) United States Department of Agriculture. 1980. Report of the Public's Comments on the RCA Draft Documents, January-March 1980.

CHAPTER 7
THE PREFERRED PROGRAM

After considering the alternatives as presented in chapter 6, the Secretary of Agriculture selected alternative 3 as the one most likely to approach, within the overall budgetary guidelines of this Administration, the requirements for protection of the Nation's soil and water resources.

The preferred program is based on cooperative actions among local and state governments and the federal government for solving resource problems. Cooperative solutions to resource problems are not new. Local conservation districts, county Agricultural Stabilization and Conservation (ASC) committees, and extension advisory committees work closely with the local offices of the Soil Conservation Service (SCS), Agricultural Stabilization and Conservation Service (ASCS), and Extension Service (ES) to provide technical assistance, financial assistance, and information and education services to land owners. The preferred program retains these existing organizations and relationships to expand the capacity of state and local governments to recognize and solve resource problems.

The preferred program moves away from the "cafeteria," or "first come, first served," approach of traditional conservation programs conducted by the United States Department of Agriculture. It addresses instead specific national resource conservation priorities. The top priority is the reduction of soil erosion, and the second priority is the reduction of upstream flood damages. The cornerstone of the preferred program is the targeting of soil conservation actions to reduce soil erosion and related conservation problems that impair the Nation's agricultural productivity.

USDA developed the preferred program after carefully considering the responses received during the 1980 RCA public comment period and views obtained from the 1979 public opinion survey conducted by Louis Harris and Associates, Inc. These activities show that the public favors a program that achieves conservation objectives through voluntary participation with more emphasis on decisions made at local and state levels. People view soil, water, and related resources as national assets that should be used but not wasted and are concerned that not enough is being done to preserve the capacity of the Nation's resources to meet future needs. The public says that adopting specific objectives would lead to more effective action on addressing critical resource problems and that agricultural use should be given priority over other uses of these scarce resources.

Most of all, the public expects a cooperative partnership among land owners and users, local and state governments, and the federal government in meeting national priorities and protecting the public interest in the conservation of soil and water resources. Therefore, the preferred program is the most responsive and practical approach for meeting national, state, and local needs as identified in the appraisal, the analysis of alternatives, and the public's comments.

This chapter presents an overview of the preferred program. To review a full description of alternative 3, see again pages 6-18 through 6-33.

Highlights of the Preferred Program

The preferred program--

- o establishes clear national priorities for addressing problems associated with soil, water, and related resources over the next 5 years. The highest priority is reduction of soil erosion to maintain the long-term productivity of agricultural land. The next highest priority is reduction of flood damages in upstream areas. Water conservation and supply management, water quality improvement, and community related conservation problems have next priority. Fish and wildlife habitat improvement and organic waste management are an integral part of solutions to these problems.

- o strengthens the existing partnership among land owners and users, local and state governments, and the federal government. This partnership will identify needs and develop and implement soil and water conservation programs. Through this partnership, the program--

  - provides federal matching block grants to states for an expanded role in developing and implementing conservation programs, the federal funds to be obtained by reducing current federal conservation program funds.

  - provides for a Local Conservation Coordinating Board made up of representatives of the conservation district, county ASC committee, extension advisory committee, and other interested parties. This board will appraise local conditions and needs, develop programs, and work through existing local, state, and federal institutions. The local board will concentrate on solving problems and achieving program objectives.

  - provides for a State Conservation Coordinating Board, with members appointed by the Governor, to appraise overall state conditions and needs. The state board will use programs adopted at the local level to develop and implement state soil and water conservation programs.

  - establishes a USDA National Conservation Board to advise the Secretary of Agriculture on conservation matters.

  - bases state and federal cooperative conservation actions on an agreement between each Governor and the Secretary of Agriculture.

- o provides for increased and more efficient cooperation and budget coordination among USDA agencies with conservation program responsibilities.

- o continues or initiates the following program actions to achieve conservation objectives. The program--

- targets an increased proportion of USDA conservation program funds and personnel to critical areas where soil erosion or other resource problems threaten the long-term productive capacity of soil and water resources.

- emphasizes conservation tillage and other cost-efficient measures for reducing soil erosion and solving related problems.

- calls for evaluation of tax incentives as an inducement to increased use of conservation systems.

- increases emphasis on technical and financial assistance to farmers and ranchers who plan and install needed and cost-efficient conservation systems.

- targets USDA research, education, and information services toward immediate and long-term objectives that will protect and maintain the productive capacity of agricultural lands.

- permits and supports the use of pilot projects to evaluate solutions for persistent resource problems and to test potential new solutions.

- requires conservation plans consistent with locally determined standards for recipients of Farmers Home Administration loans.

- minimizes conflicts among features of USDA programs that limit achievement of conservation objectives.

- strengthens collection and analysis of data on resource conditions and trends and conservation needs and provides data useful at the state and local levels.

- provides for systematic evaluations and analyses of conservation programs to determine their effectiveness and progress in achieving conservation objectives.

- expands the use of long-term agreements in providing technical and financial assistance to farmers and ranchers.

Effectiveness of the Preferred Program

Evaluations of current soil and water conservation programs were considered in formulating the preferred program, as discussed in chapter 5. Therefore, the preferred program--

o establishes clear program objectives to increase efficiency.

o sets priorities to help field personnel plan and schedule their work to improve program implementation.

- o recognizes the diversity of resource conditions and formulates national policies and procedures that can be adapted to state and regional needs to increase program effectiveness.

- o encourages the involvement of individuals and organizations in changing the program to make it more effective and acceptable.

- o emphasizes increased research, education, and technical assistance to develop resource management and conservation systems that are cost-efficient.

- o provides for better coordination among USDA agencies to achieve unanimity of purpose in planning and budgeting for conservation programs.

- o requires monitoring and evaluation that lead to prompt adjustments in the program to achieve maximum effectiveness and acceptability.

Funding for the Preferred Program

The distribution of federal funds under the preferred program over the next 5 years is shown in table 7-1.

Chapter 8 shows the expected consequences of implementing the preferred program.

Table 7-1.--Projected fifth-year distribution of funds among major components, preferred program 1/

Major component	1981 (base year)	Funding		
		Level funding	Upper bound	Lower bound
		(millions of dollars)		
1. Technical assistance----	198	211	212	185
2. Financial assistance:				
a. Cost shares to operators----------	278	164	166	179
b. For project activities----------	177	167	211	134
c. Subtotal financial assistance----------	(455)	(331)	(377)	(313)
3. USDA matching funds-----	---	105	175	30
4. Education/Information (Extension Service)-----	12	14	15	10
5. Research and technology development----------	74	80	88	71
6. Data collection and analysis----------	81	79	87	72
7. Emergency programs 2/---	17	17	17	17
TOTAL----------	837	837	971	698
Loans----------	(77)	(72)	(82)	(60)

1/ All funds are shown in millions of constant 1979 dollars rounded to the nearest million.

2/ Held constant because it is impossible to predict emergencies.

CHAPTER 8
ENVIRONMENTAL CONSEQUENCES

This chapter identifies significant consequences that would likely follow adoption of the preferred program or one of the alternatives. These consequences are presented in three categories: physical and biological, economic, and social. Physical and biological consequences include effects on the quality of soil, water, air, and habitat for fish and wildlife. Economic consequences include program costs and benefits. Social consequences include factors that affect the quality of life.

None of the program alternatives would reverse the trends that threaten the productive capacity of the Nation's soil and water resources. The preferred program, however, would have the greatest effect in slowing the loss of this capacity.

Although nondegradation of these resources should be the ultimate national objective for soil and water conservation programs, additional analysis and preparation will be required for designing and implementing plans for approaching this goal.

The likely short-term (5-year) and long-term (50-year) consequences of the preferred program and each alternative at level funding are described in the following narrative. The consequences at other funding levels are displayed in figures 8-1 through 8-8 (pages 8-9 through 8-12) and further detailed in chapter 6.

Physical and Biological Consequences

Preferred Program

The preferred program provides for more conservation activity than do the alternative programs and consequently would have the greatest positive effect on soil and water resources. Degradation of the resource base would continue, but at a reduced rate. The following short-term physical and biological effects could be expected.

- Gross annual erosion would be about 860 million tons less than the amount reported in the 1977 National Resource Inventories (NRI).
- The acreage of cropland eroding at rates more than 5 tons per acre annually would be reduced from the 141 million acres reported in the NRI to 126 million acres.
- The amount of sediment that reached surface waters from agricultural nonpoint sources would be about 320 million tons less than the amount reported in the NRI.

Preferred Program

Under the preferred program, the following short-term economic consequences would likely occur:

- Production costs and consumer prices would probably increase modestly.
- Annual upstream flood damages would be about $28 million less than in 1977.
- Federal matching grant funds in the initial years probably would be $50 to $100 million annually, depending on the amounts that states were willing and able to match.

Over the long term, the following effects could be expected:

- The unit cost of producing food and fiber would decrease from an index of 230 in 1977 to 200 by the year 2030. Land owners and operators and society would benefit from maintenance of long-term soil productivity. Where erosion could be controlled with low-cost measures such as conservation tillage, even the short-term costs of production might decline.
- Annual upstream flood damages would be about $390 million less than in 1977.

Alternative 1: Continuation of Current Program Trends

If current program trends continued, the following short-term consequences could be expected:

- Funding for research, education, data collection, and analysis would increase. These activities would contribute to a better understanding of resource conditions, trends, and problems.
- The amount of funds available for cost-share assistance for conservation measures on agricultural lands would decline from about 33 to 26 percent of total USDA conservation funds. Reduced funding available for cost sharing could threaten the continuation of the county Agricultural Stabilization and Conservation (ASC) committee system in some counties.
- Total funding for technical assistance would decline by about 9 percent. Because of cuts primarily in the level of cost sharing and loans to individuals, however, the proportion of total funding for technical assistance would increase from 23 percent to 26 percent.
- Initial USDA efforts to target on critical problem areas would be hampered by declining funds available for technical and cost-share assistance.
- Annual upstream flood damages would be about $23 million less than in 1977.

The following long-term consequences could be expected:

- Food and fiber production costs would increase more than 38 percent. Prices to consumers would also increase.
- Annual upstream flood damages would be $240 million less than in 1977.
- Initially, direct costs--such as those required for additional fertilizer--to program participants would not increase. As the soils were further eroded and as new developments in conservation technology were slowed, direct costs to the farmer would increase because of reduced productivity. Consequently, conservation would likely be foregone in the interest of short-term profits.
- Reduced federal activity would result in increased reliance on local and state governments and private individuals to provide the conservation measures necessary to maintain the productive capacity of soil and water resources.

Alternative 2: Redirection of USDA Programs Toward Critical Agricultural Resource Problems

The following short-term consequences could be expected:

- Funds would be targeted to high-priority problem areas.
- If maximum cost efficiency were achieved, the costs of production would not increase significantly and public benefits could increase. The number of employees in federal conservation programs would remain about the same or would increase slightly if funding were increased.
- The Agricultural Stabilization and Conservation Service (ASCS) and the Soil Conservation Service (SCS) would commit an additional 5 percent of their financial and technical assistance budget each year to specified high priority areas until 25 percent of the soil and water conservation funds were committed to these areas.
- Annual upstream flood damages would be $27 million less than in 1977.

The following long-term effects would likely occur:

- The unit cost of producing food and fiber would increase by about 16 percent.
- Annual upstream flood damages would be about $360 million less than in 1977.

Social Consequences

Preferred Program

The preferred program can be expected to have a net beneficial effect on both urban and rural populations. Government agencies will work with individuals and local groups to reduce the adverse effects of critical soil erosion, sedimentation, and flooding on agricultural productivity. As a result, the quality of life in these critical areas and in other areas will be improved through opportunities for increased income; improved quality of air and water; and decreased risk of death, injury, and property loss from flooding. Rural communities will benefit from maintenance of high levels of food and fiber production, flood damage reduction, improvement of air and water quality, increased opportunities for employment, stabilization of the farm population, and enhancement of rural life.

Activities associated with development of local conservation programs should foster community cohesiveness and provide a mechanism through which any potentially negative social effects of proposed conservation strategies could be identified and mitigated early.

The greatest social benefit of the preferred program is long term: the preservation of the resource base so that the quality of life for future generations will be maintained or improved.

Implementation of the preferred program would somewhat affect existing institutional arrangements and the operations of such institutions. Under the preferred program, USDA soil and water conservation activities would be carried out in closer cooperation with state and local governments. USDA agencies would have less flexibility in the allocation of personnel and financial resources because resources would be targeted to critical areas. The emphasis on critical areas and on stronger mutual planning of statewide conservation programs might necessitate some adjustments in conservation practices applied. Present allocation of resources within and among counties might require adjustment. The integration of other federal and state authorities, such as the EPA water quality management program, into the conservation program could produce efficiencies in achievement of related federal and state objectives.

Alternative 1: Continuation of Current Program Trends

Continuation of the existing institutional arrangements would tend to minimize any controversy. Long-term benefits to society, however, would be reduced because resource productivity would decline.

Alternative 2: Redirection of USDA Programs Toward Critical Agricultural Resource Problems

Any major shifts in the allocation of funds and technical assistance to targeted areas--especially between states for existing programs such as the Agricultural Conservation Program (ACP), Great Plains Conservation Program

(GPCP), or SCS technical assistance--could generate some opposition. Participation by state and local governments in program development could lead to more optimal allocations of budget and personnel within states. These adjustments, however, could disrupt some conservation activities.

Civil Rights

USDA examined the preferred program and alternative programs for their potential effect on civil rights and concluded that there would be no adverse effects on minorities or women. USDA conducts its programs in compliance with all nondiscrimination requirements contained in the Civil Rights Act of 1964 and the Regulations of the Secretary of Agriculture (7 C.F.R. Sec. 15.1-15.12), which provide that no person in the United States shall, because of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any activity receiving federal financial assistance. Further, it is USDA policy not to discriminate against any individual because of sex, age, or handicap.

Threatened and Endangered Species

As of August 1979, 214 animals and 24 plants were on the federal list of endangered or threatened species, as authorized by the Endangered Species Act of 1973. These species are sporadically and irregularly distributed throughout the United States. Some of these species would almost certainly be encountered as conservation measures were applied to private rural lands. In accordance with the law, USDA procedures are designed to ensure that no action will jeopardize the continued existence of listed species or destroy their habitats. For purposes of this analysis, USDA assumed that its future conservation programs would be conducted so that there would be no significant detrimental consequences to threatened or endangered species or their critical habitats.

Cultural Resources

Conservation of our natural resources is not complete without consideration of our cultural environment. Many of our conservation problems and practices today are the result of past successes and failures, as evidenced by remaining cultural resources (archeological and historic). If we are to profit from the past, cultural resource preservation must be an integral part of our conservation efforts.

Over 22,000 important cultural resources are listed on the National Register of Historic Places maintained by the Department of the Interior. Many more are known to exist throughout the United States.

In implementing these programs, USDA will comply with its planning and cultural resources protection procedures (7 C.F.R. 3100) and with applicable historic preservation laws to ensure the protection of our Nation's cultural heritage.

Unavoidable Adverse Effects

The analysis indicates that if soil and water conservation programs are not effective there will be continued degradation of the soil resource base through erosion, continued threat to human life and agricultural and other lands as a result of flooding, and continued degradation of water quality from agricultural pollutants. Increases in the efficiency of agricultural irrigation will be slight, and wetland losses will continue.

It may be necessary to remove some highly erodible land from crop production. Some land owners may consider this requirement controversial. USDA anticipates no other significant unavoidable adverse effects.

USDA considers that the limited temporary increases in noise, air pollution, and soil erosion that may result from the installation of conservation practices and the associated minor losses of wildlife habitat will be insignificant from a national viewpoint.

Irreversible and Irretrievable Commitment of Resources

Funds, labor, materials, and energy expended to install conservation systems would be irretrievably committed. Lands on which permanent structural measures are installed would be committed for the foreseeable future.

Possible Areas of Controversy

- In some years, converting land from agricultural production to less intensive use would conflict with perceived needs for increased agricultural production.
- Some individuals may think that strong economic incentive programs conflict with efforts to establish a voluntary basis for soil and water stewardship.
- Implementation of the preferred program could generate controversy about allocation of funds and personnel.
- In areas where conservation practices would affect water supply and conservation, controversy should be expected over the possible effects on wildlife habitat and the responsibilities for mitigation of losses.
- The impact of the preferred program on the other USDA programs may stimulate controversy.

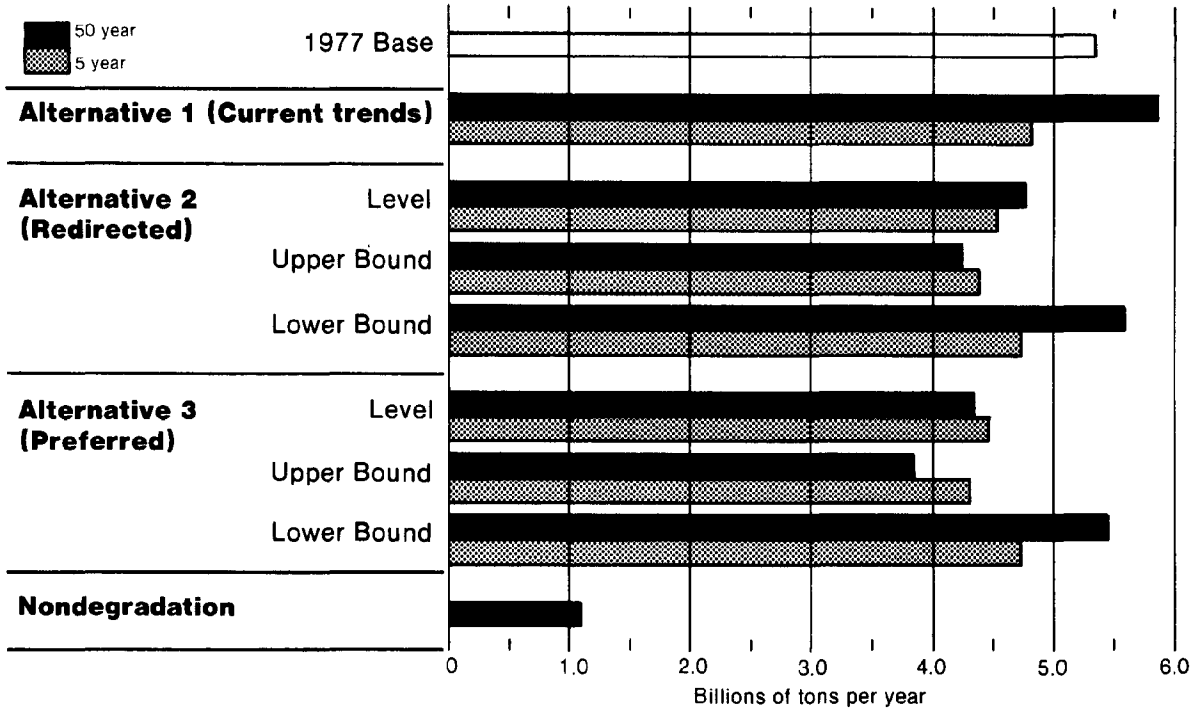

Figure 8-1.--Projected gross erosion under the preferred program and alternatives at the end of 5 years and 50 years.

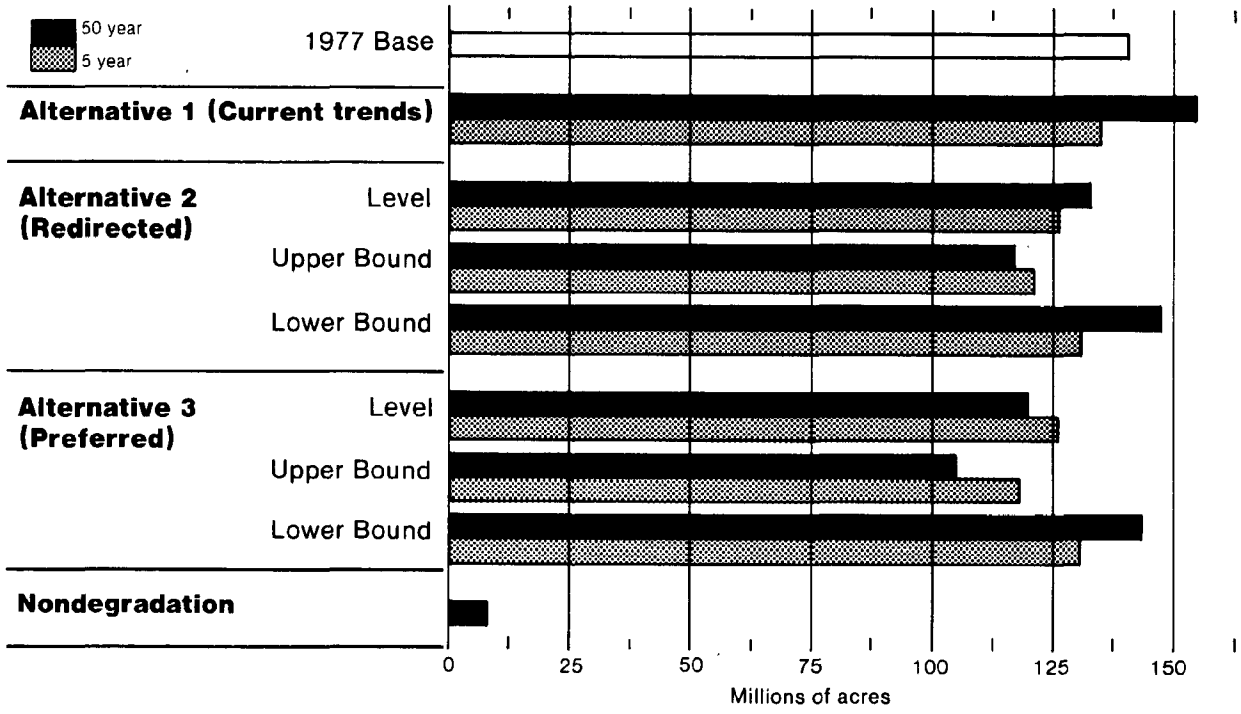

Figure 8-2.--Projected acreage of cropland eroding at an annual rate of more than 5 tons per acre under the preferred program and alternatives at the end of 5 years and 50 years.

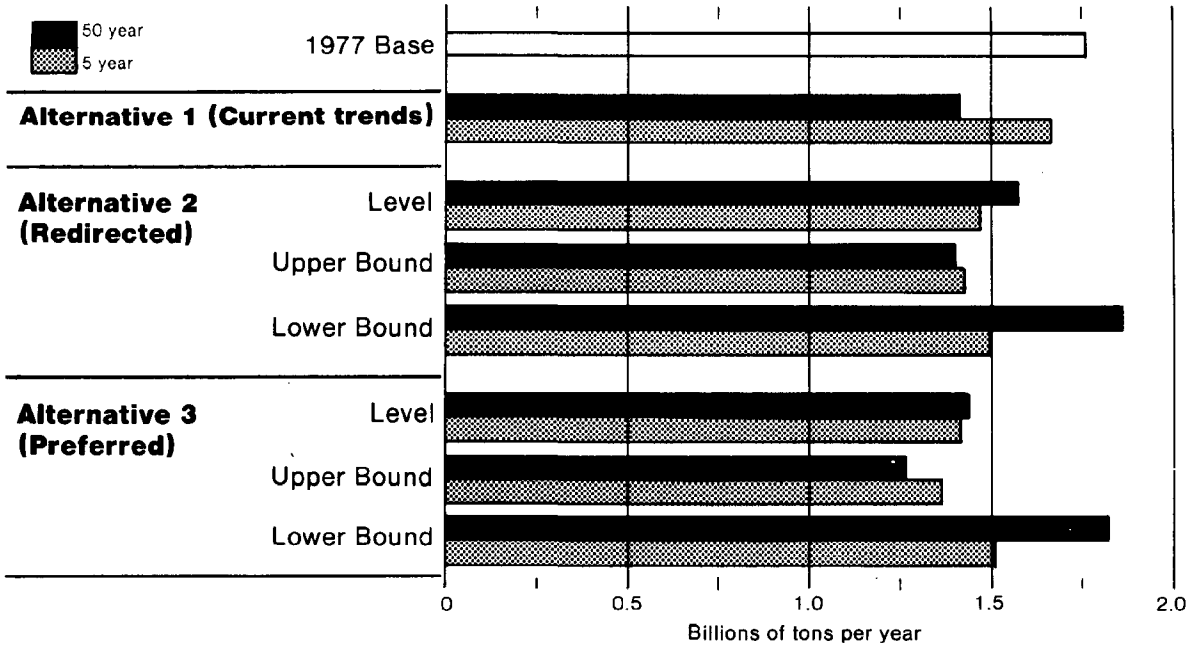

Figure 8-3.--Projected sediment from agricultural sources under the preferred program and alternatives at the end of 5 years and 50 years.

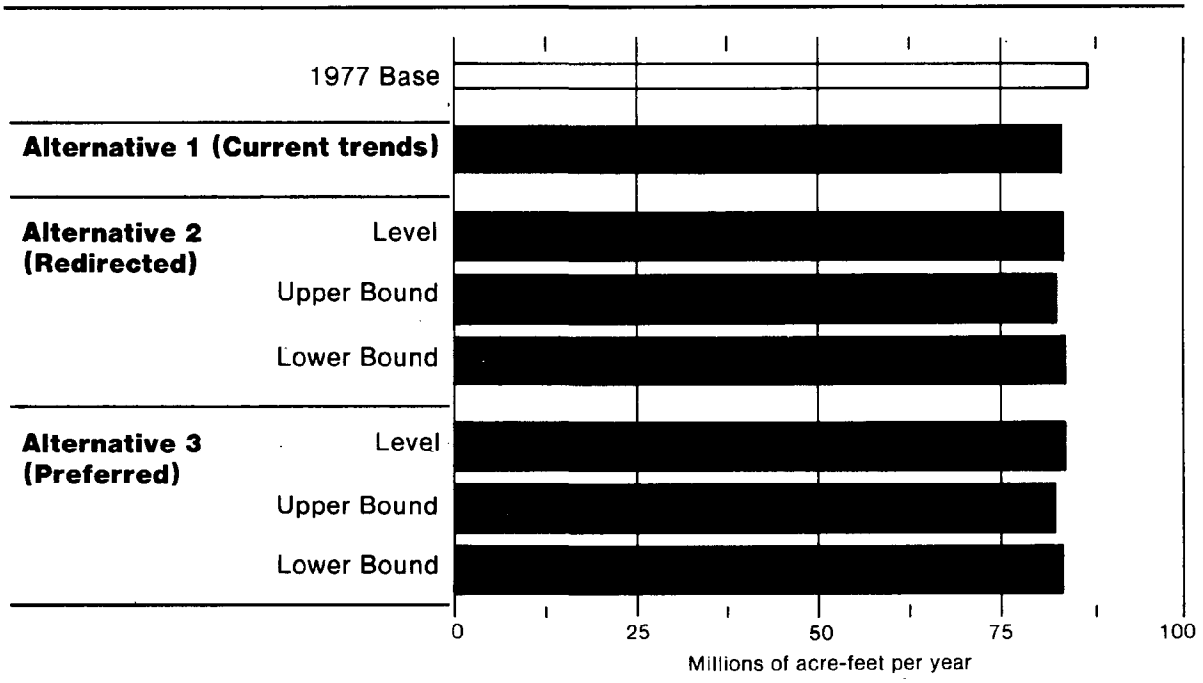

Figure 8-4.--Projected water depletions resulting from agricultural uses under the preferred program and alternatives at the end of 50 years.

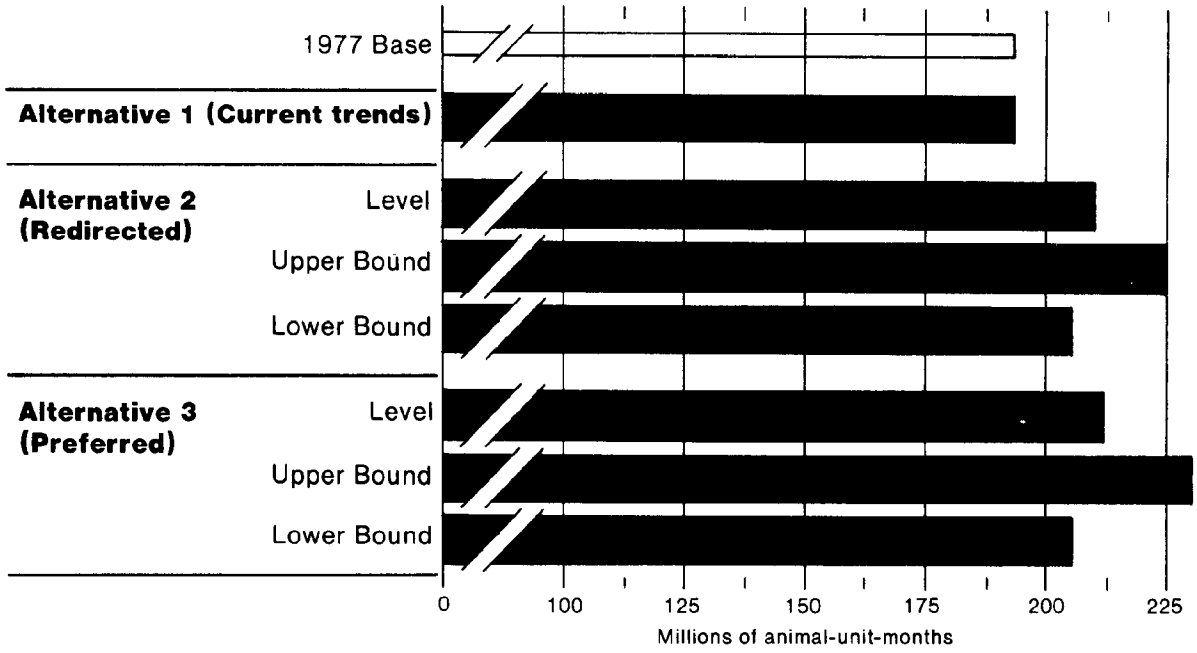

Figure 8-5.--Projected rangeland productivity under the preferred program and alternatives at the end of 50 years.

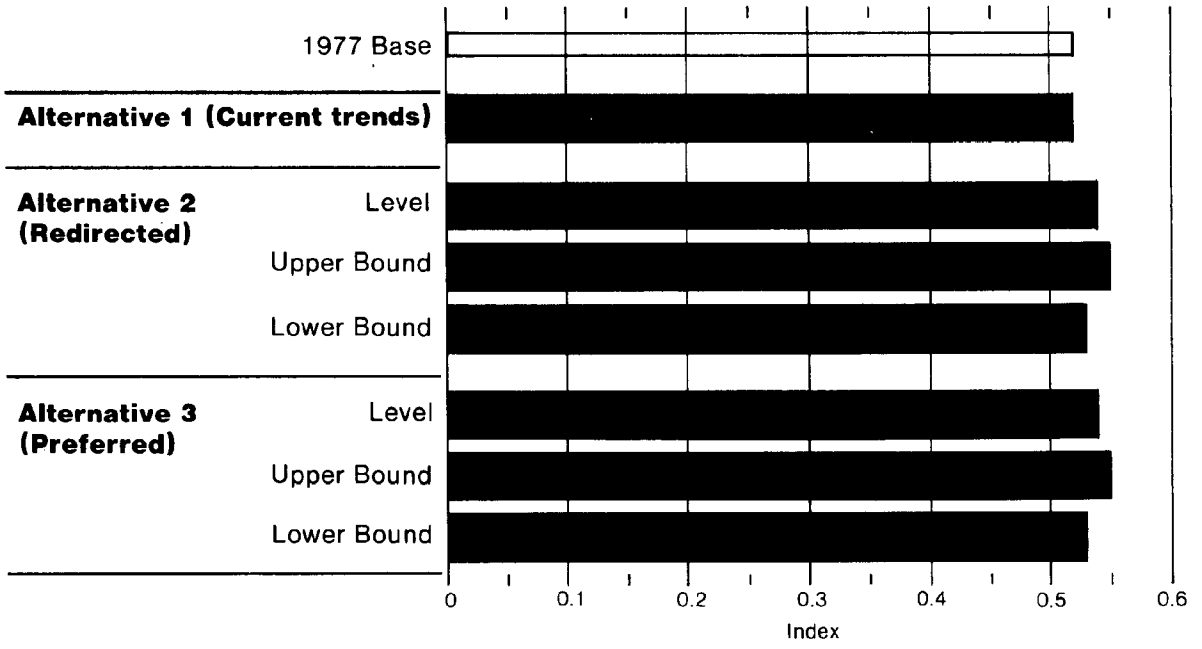

Figure 8-6.--Projected wildlife habitat quality on agricultural land under the preferred program and alternatives at the end of 50 years.

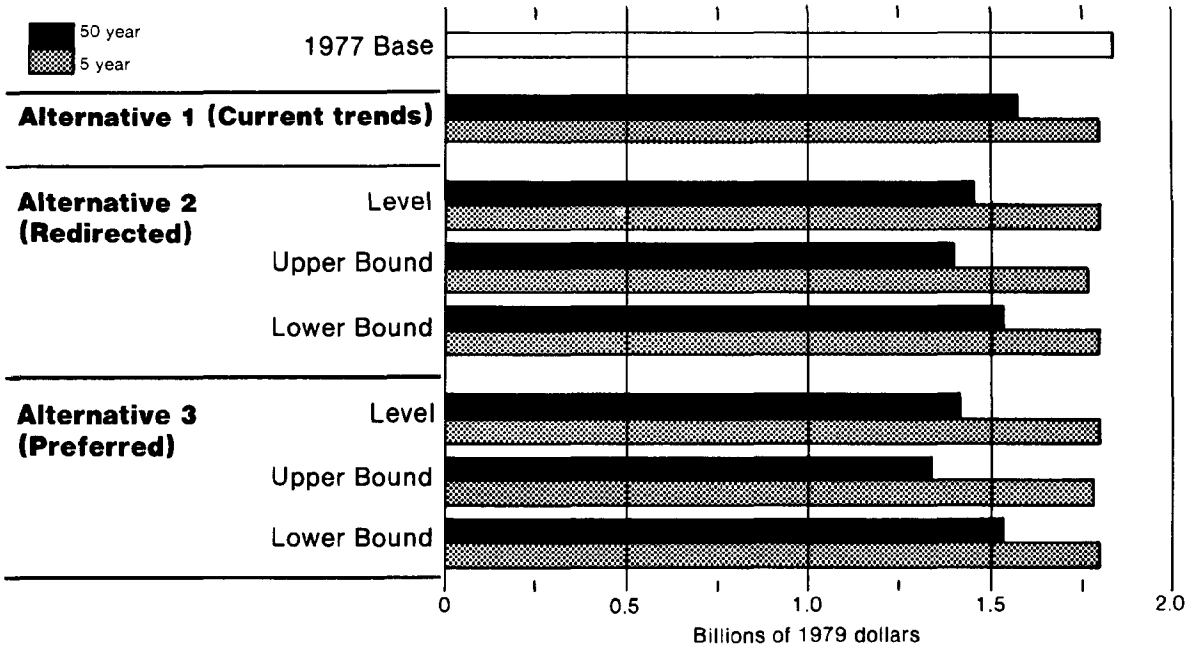

Figure 8-7.--Projected upstream flood damages under the preferred program and alternatives at the end of 5 years and 50 years.

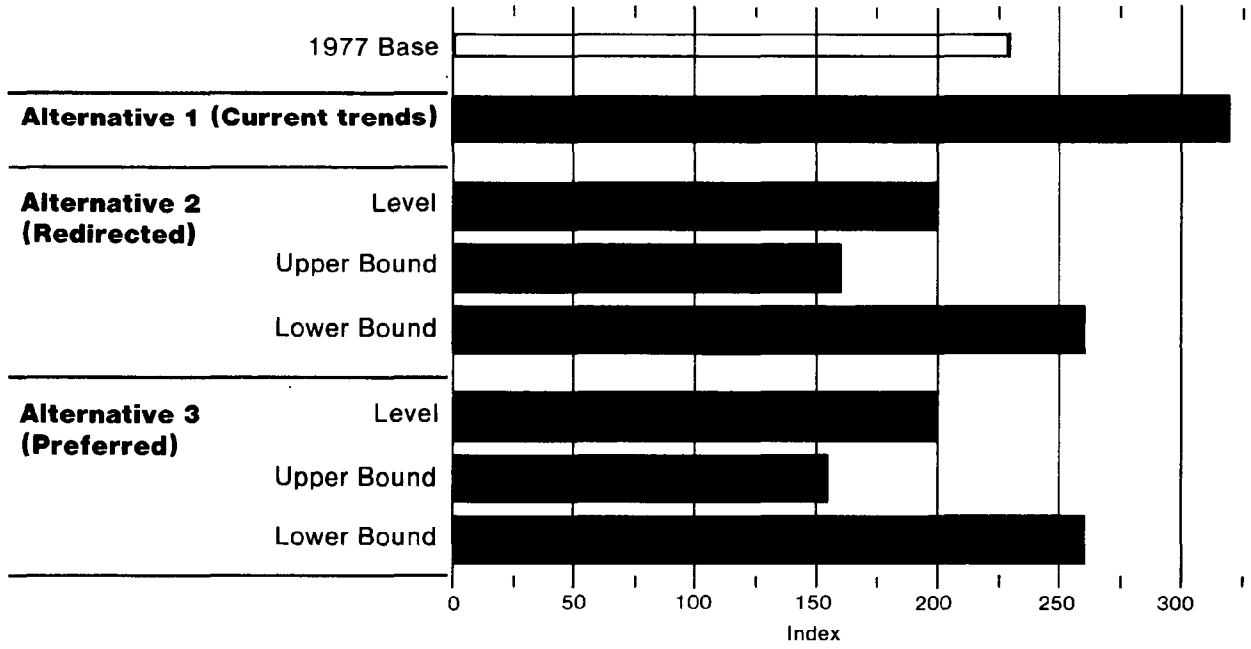

Figure 8-8.--Projected food and fiber production costs under the preferred program and alternatives at the end of 50 years.

CHAPTER 9
EVALUATION OF THE PREFERRED PROGRAM

Program evaluation is the analysis of how well a program achieves its objectives. Evaluations provide policy officials and program managers with information on the need and opportunity for improving the management and effectiveness of ongoing programs.

This chapter establishes the evaluation concepts and organizational structure that will guide the evaluation of the program presented in chapter 7. Program evaluation is needed to meet requirements set forth in section 7(c) of the Soil and Water Resources Conservation Act of 1977 (RCA):

> The [annual RCA] report, prepared in concise summary form with detailed appendices, shall contain pertinent data from the current resource appraisal . . . shall set forth the progress in implementing the program . . . and shall contain appropriate measurements of pertinent costs and benefits.

Program evaluation usually deals with a single program that may have single or multiple objectives. Under RCA, however, the situation is more complex. The soil and water conservation programs of the United States Department of Agriculture (USDA) are administered by eight of the Department's agencies. These programs have different legislative authorities and employ different delivery systems to assist land owners and operators in installing conservation systems.

Evaluation of Individual Programs

Evaluation of a specific program is the responsibility of the agency that administers the program. Each agency will consider the recommendations of an interagency evaluation work group in establishing its priorities for evaluation. Each agency will submit to the Chief of the Soil Conservation Service (SCS) an annual report detailing the status of evaluation of its programs. The SCS Chief will use these reports in preparing the annual RCA evaluation report.

Each evaluation will analyze the effectiveness and efficiency of each program and the degree to which it contributes to the overall RCA objectives. Table 9-1 summarizes the status of specific program evaluations.

For each evaluation, the responsible agency will prepare a plan of work, which will include--

- a statement of overall program objectives and those that will be evaluated.
- discussion of the major issues or concerns associated with the program that relate to achieving program and RCA objectives.
- evaluation criteria.

- procedures for measuring program effectiveness.

- description of the analytical techniques and data sources to be used in the evaluation.

- schedules and assignments.

The major components of each evaluation report will be technical assistance, financial assistance, research, extension, loans, and data collection and analysis. Interrelationships with other USDA programs will be considered.

The Annual RCA Evaluation Report

The SCS Chief will coordinate the preparation of the annual RCA evaluation report with guidance from the Assistant Secretary of Agriculture for Natural Resources and Environment. An interagency evaluation work group, composed of representatives from USDA conservation agencies and from the USDA Office of Budget and Program Analysis, will advise the SCS Chief on technical matters and review the evaluations that the individual USDA agencies made. Responsibilities of the group include--

- facilitating the exchange of information, data, and available evaluation methodologies among agency evaluation staffs.

- recommending evaluation schedules for RCA-related programs to agency administrators.

- providing guidance and assistance in developing and preparing program evaluations.

- developing indicators to measure progress toward meeting program objectives.

The RCA evaluation report will place paramount importance on the ability of USDA agencies to document specific questions and issues. Although quantification is convenient and helps define the dimension in which issues or questions may be addressed, it is not necessarily all-inclusive. Intangible attributes, both positive and negative, need to be documented and included in the narrative.

The report will--

- contain appropriate measures of pertinent program costs and benefits for regional areas as well as nationwide.

- assess factors that affect the economy and environmental quality.

- assess new program directions that should be taken as a result of evaluation activity.

- identify needed legislative changes.

The Secretary of Agriculture will submit the report to Congress through the President. The report will accompany the President's budget to Congress.

Table 9-1.--Status of evaluations of USDA soil and water conservation programs, 1981

Program	Responsible agency	Status of evaluation	Priority of evaluation
Soil, Water, and Air Sciences Research	ARS	In process	---
Agricultural Conservation Program (ACP) 1/, 2/	ASCS	First phase completed Second phase in process	--- High
Emergency Conservation Program (ECP)	ASCS	Planned	---
Forestry Incentives Program 1/	ASCS	In process	---
Rural Clean Water Program (RCWP)	ASCS	In process	High
Water Bank Program (WBP)	ASCS	Planned	---
Cooperative Research in Agriculture and Forestry	CSRS	In process	---
Natural Resource Economics Research	ERS	In process	---
Land and Water Conservation Education	ES	In process	---
Soil and Water Loans to Individuals	FmHA	In process	---
National Forest System	FS	Not within RCA	---
Research	FS	Needed-not planned	Low
State and Private Forestry	FS	Planned	---
Conservation Operations	SCS	In process	High
Cooperative River Basin Studies 2/, 3/	SCS	In process	High
Emergency Watershed Operations (Section 216)	SCS	Completed	---
Flood Prevention Operations (PL-534)	SCS	Planned	Low
Great Plains Conservation Program	SCS	Planned	High
Inventory and Monitoring	SCS	Planned	Medium
Plant Materials Centers	SCS	In process	Medium
Resource Conservation and Development	SCS	In process	Medium
Rural Abandoned Mines Program 3/	SCS	In process	Medium
Snow Survey and Water Supply Forecasting	SCS	Planned	Medium
Soil Survey	SCS	Planned	Medium
Watershed Planning and Operations (PL-566)	SCS	Planned	High

1/ Coordinated with FS.
2/ Coordinated with SCS.
3/ Coordinated with ERS.

CHAPTER 10
PUBLIC CONSULTATION AND PREPARATION AND DISTRIBUTION OF THE REPORT

Public Consultation

This Revised Draft Program Report and Environmental Impact Statement is the culmination of the first stage of a process begun shortly after passage of the Soil and Water Resources Conservation Act of 1977 (RCA). This process of developing a national conservation program will continue through 1985. As required by the law, the United States Department of Agriculture (USDA) has involved the public at specific points in the process.

Three large-scale public participation activities have been conducted to date: (1) a series of public meetings to solicit views on soil, water, and related resource concerns and problems, (2) a public opinion survey conducted by Louis Harris and Associates, Inc., and (3) a public review of earlier RCA draft documents.

As the initial stage of the process of developing the program, USDA officials and experts from a wide range of disciplines discussed soil and water resource problems and implications for the future. In the summer and fall of 1978, USDA learned from people across the Nation about their assessments of resource problems. USDA agencies and cooperating organizations explained RCA and discussed resource concerns at 9,000 local, state, and multistate meetings attended by more than 164,000 people.

USDA representatives also presented information about RCA at many meetings convened by other organizations. People were asked to identify resource concerns and problems and to suggest possible solutions. The concerns expressed most often at these meetings were: soil erosion; food and fiber production; land use; water supply; water quality; flooding; irrigation; rural development; drainage; and retention of prime, unique, and important farmland.

In 1979, the Soil Conservation Service (SCS) commissioned Louis Harris and Associates, Inc., to survey the public's attitudes toward soil, water, and related resources conservation policy. More than 7,000 adults, a statistically representative sample, were interviewed. Findings of the survey are fully described in a report published by the Harris organization (1).

As work progressed, USDA expanded the program development process to allow more intensive work by eight USDA agencies, the Office of Management and Budget, and the Council on Environmental Quality. This expanded phase led to the publication of several major reports: the Draft RCA Appraisal Parts I and II, the Draft Program Report and Environmental Impact Statement, and the Summary of the Appraisal and Program Report. Early in 1980, the Department invited people to submit written comments on these documents. After the 60-day review period, the Department analyzed 64,872 responses submitted by 118,213 people. Their comments are discussed in detail in a separate report (2).

Decisionmakers and staff analysts carefully considered the views expressed through each of these public participation activities as they formulated the preferred national soil and water conservation program and alternative programs. The draft proposal published in 1980 was refined to reflect current conservation and budgetary philosophies. The USDA preferred national program and alternative programs are now presented for review and comment in accordance with the National Environmental Policy Act.

List of Preparers

This report was prepared by a special task force working under the guidance of John B. Crowell, Jr., Assistant Secretary of Agriculture for Natural Resources and Environment, and Richard D. Siegel, Deputy Assistant Secretary for Natural Resources and Environment. Members of this task force included:

Kenneth L Williams, Deputy Chief for Planning and Evaluation, SCS, Team Leader. B.S. (Agronomy), Brigham Young University; M.S. (Natural Resources Administration), University of Michigan. Before he was assigned to his present position, Mr. Williams served for 8 years as the Director of the SCS West Technical Service Center and as the SCS Administrator's representative to 13 western States. Before that, he served as State Conservationist, New Mexico; Assistant State Conservationist, Arizona; and area, district, and soil conservationist in Indiana, California, and Utah. He is a member of the Soil Conservation Society of America.

David G. Unger, Associate Chief, SCS. B.A. (Earth Science), Antioch College; M.A. (Political Science), University of Pennsylvania; M.P.A. Harvard University. Before assuming his present position, Mr. Unger served as Deputy Assistant Secretary of Agriculture for Natural Resources and Environment. Prior to that, he was Executive Vice President of the National Association of Conservation Districts (NACD). Earlier, he served as Director of the Pennsylvania Soil and Water Conservation Commission. He began his career with the Brandywine Valley Watershed Association and the Upper Susquehanna Watershed Association.

Peter M. Tidd, Director, Appraisal and Program Development, SCS. B.S. (Resource Development), University of Maine; M.A.R.E., University of Maine; M.P.A., Harvard University. Before he was assigned to his present position, Mr. Tidd spent 4 years on the water resources staff at SCS Headquarters. His earlier responsibilities involved water and related land resource programs in Tennessee, Illinois, and Louisiana. Earlier, Mr. Tidd worked for 5 years in Maine as soil conservationist and agricultural economist.

Gary A. Margheim, Environmental Coordinator, SCS. B.S. (Civil Engineering), Colorado State University; M.S. (Civil Engineering), Colorado State University; Ph.D. (Sanitary Engineering), Colorado State University. Before assuming his present position, Dr. Margheim was Director of Enviromental Services for SCS. Earlier, he served as an engineer in Texas, Oregon, and Colorado. Dr. Margheim is a member of the American Waterworks Association, the American Society of Civil Engineers, the Soil Conservation Society of America, and the Water Pollution Control Federation.

Ida D. Cuthbertson, Public Participation Coordinator, SCS. B.A. (Economics), Ohio State University; M.U.A., Virginia Polytechnic Institute and State University. Before being appointed to her present position, Ms. Cuthbertson

served in resource planning for SCS. Earlier, she was public health statistician for the Ohio Department of Health, Columbus. She is a member of the American Institute of Certified Planners (charter member), the American Planning Association (charter member), the Soil Conservation Society of America, and World Future Society.

James N. Benson, Writer-Editor, Appraisal and Program Development, SCS. B.A. (English), University of Maryland; M.A. (American Studies), University of Maryland. Before assuming his present position, Mr. Benson served as an editor with SCS in Maryland and Texas.

Others who assisted in the preparation of this report were: John Fedkiw, USDA Office of Budget and Program Analysis; Roy M. Gray, SCS; John L. Okay, SCS; Clayton R. Miller, SCS; Emma B. Corcoran, SCS; and Enid C. Green, SCS.

Distribution of the Report

Interested federal, state, and local agencies and the public are invited to review and comment on the USDA preferred program and alternative programs published in this Revised Draft Program Report and Environmental Impact Statement. USDA placed a Notice of Intent to adopt this program in the Federal Register at the time of distribution. At the same time, about 2,000 copies of this document were sent to individuals, organizations, and governmental agencies with a request for written comments on the preferred program. In addition, 400,000 copies of a brief summary of the program and an attached response form were distributed throughout the country. Interested individuals, organizations, and agencies may contact the nearest office of the Soil Conservation Service to obtain the summary or this report.

USDA sent this report to interested individuals and groups, including agricultural, academic, business, industrial, labor, civic, consumer, environmental, conservation, professional, religious, minority, and youth organizations. Copies of the summary were sent to people who commented on the draft documents released in January 1980.

The following and other federal officials were sent copies of this report:

Director, Office of Equal Opportunity, U.S. Department of Agriculture
Chief of Engineers, Department of the Army
Institute for Water Resources, Corps of Engineers, Department of the Army
Deputy Assistant Secretary for Environmental Affairs, U.S. Department of Commerce
Office of Coastal Zone Management, U.S. Department of Commerce
Director, Office of Federal Affairs, U.S. Environmental Protection Agency
Assistant Secretary for Administration and Management, U.S. Department of Health and Human Services
Secretary, U.S. Department of the Interior
Director, Office of Environmental Project Review, U.S. Department of the Interior
Coordinator, Water Resources, U.S. Coast Guard, U.S. Department of Transportation

Federal Cochairman, Appalachian Regional Commission
Executive Secretary, Council on Historic Preservation
Chairman, Board of Directors, Tennessee Valley Authority

In addition, copies were sent to the following and other national organizations:

Advisory Council on Historic Preservation
Agricultural Research Institute
Alliance for Environmental Education, Inc.
American Agronomy Society
American Association of Minority Enterprise
American Association of Nurserymen, Inc.
American Conservation Association, Inc.
American Council of Consumers' Interests
American Dairy Science Association
American Farm Bureau Federation
American Federation of Labor
American Feed Manufacturers Association
American Fisheries Society
American Forestry Association
American Land Forum
American Meat Institute
American National Cattlemen's Association
American Planning Association
American Public Works Association
American Rice Growers, Inc.
American Rivers Conservation Council
American Seed Trade Association
American Sheep Producers Council
American Society of Agricultural Engineers
American Society of Agriculture Consultants
American Society of Agromomy
American Society of Civil Engineers
American Society of Farm Managers and Appraisers
American Society of Landscape Architects
American Water Resources Association
Association of State Soil Conservation Administrative Officers
Brookings Institution
Burley and Dark Leaf Tobacco Export Association, Inc.
Center for Rural Affairs
Center for Agricultural and Rural Development
Center for Science in the Public Interest
Center for Small Business
Chamber of Commerce of the United States, Agricultural Program
Community Nutrition Institute
Conference on Alternative State and Local Public Policies
Conservation Education Association
Conservation Foundation
Consumer Action Now, Inc.
Consumer Research Advisory Council
Consumers Federation of America
Consumers Union
Corn Refiners Association, Inc.
Council of Small Enterprises

Council of State Governments
Dairy Industry Committee
Defenders of Wildlife
Ducks Unlimited, Inc.
Energy Action Committee
Environmental Action
Environmental Defense Fund
Environmental Fund
Environmental Law Institute
Food Marketing Institute
Food Research and Action Center, Inc.
Foundation for American Agriculture
Friends of the Earth
Future Farmers of America
Garden Clubs of America
Great Plains Wheat Market Development
International Apple Institute
International City Management Association
International Crane Foundation
Interreligious Task Force on Food Policy
Izaak Walton League
Keep America Beautiful Foundation
Land Improvement Contractors of America
Latin American Manufacturers Association
League of Conservation Voters
League of Women Voters
National Academy of Sciences
National Agricultural Chemicals Association
National American Indian Cattleman's Association
National Association of Black Manufacturers
National Association of Conservation Districts
National Association of Consulting Foresters
National Association of Consumer Agency Administrators
National Association of Counties
National Association of Farm Worker Organizations
National Association of Farmer-Elected Committeemen
National Association of Foresters
National Association of Regional Councils
National Association of Small Business Investment Companies
National Association of State Universities and Land Grant Colleges
National Association of State Foresters
National Association of Town and Township Officials
National Association of Wheatgrowers
National Association of Women Business Owners
National Audubon Society
National Business League
National Canners' Association
National Conference of State Legislatures
National Consumers League
National Corn Growers Association
National Cotton Council of America
National Cottonseed Products Association
National Council of Farmer Co-ops
National Dry Bean Council Co.
National Economic Development Association

National Family Farm Coalition
National Farmers Organization
National Farmers Union
National Federation of Independent Business
National Forest Products Association
National Governors Association
National Grain Trade Council
National Grange
National Hay Association, Inc.
National Housewives League of America
National League of Cities
National Limestone Institute, Inc.
National Livestock Producers Association
National Milk Producers Federation
National Organization for Women
National Pork Producers Council
National Recreation and Park Association
National Research Council
National Rice Growers Association
National Science Foundation
National Small Business Association
National Solid Wastes Management Association
National Soybean Processors Association
National Sugarbeet Growers Federation
National Turkey Federation
National Water Resources Association
National Watershed Congress
National Wildlife Federation
National Wildlife Refuge Association
National Wool Growers Association
Natural Resources Defense Council
No-Till Farmer, Inc.
Pacific Northwest Grain Export Association
Potato Association of America
Public Citizen-Congress Watch
Public Interest Economics Center
Public Lands Council, Legislative Office
Renewable Natural Resources Foundation
Sierra Club
Smaller Manufacturers Council
Society of American Foresters
Soil Conservation Society of America
Soybean Growers of America
Sugar Association, Inc.
The Fertilizer Institute
The Wildlife Society
Tobacco Associates, Inc.
United Auto Workers, Conservation and Resource Development Department
United Egg Producers
United Fresh Fruit and Vegetable Association
United States Chamber of Commerce
U.S. Conference of Mayors
Water Resources Congress
Western Wheat Association, USA, Inc.

Wilderness Society
Wildlife Management Institute
Women's National Farm and Garden Association, Inc.

References

(1) Fischer, Victor; John Boyle; Mark Schulman; and Michael Bucuvalas. 1980. A Survey of the Public's Attitudes toward Soil, Water, and Renewable Resources Conservation Policy. Louis Harris and Associates, Inc. Study No. 792802.

(2) United States Department of Agriculture. 1980. Report of the Public's Comments on the RCA Draft Documents, January-March 1980.

APPENDIX

ADDRESSES OF STATE OFFICES OF THE SOIL CONSERVATION SERVICE

Please mail your comments to the State Conservationist, Soil Conservation Service, at the address listed for your state.

USDA, Soil Conservation Service
Wright Building
138 South Gay Street
Auburn, Alabama 36830

USDA, Soil Conservation Service
Suite 129, Professional Building
2221 E. Northern Lights Blvd.
Anchorage, Alaska 99504

USDA, Soil Conservation Service
3008 Federal Building
230 North 1st Avenue
Phoenix, Arizona 85025

USDA, Soil Conservation Service
Federal Office Building, Room 5029
700 West Capitol Street
Little Rock, Arkansas 72203

USDA, Soil Conservation Service
2828 Chiles Road
Davis, California 95616

USDA, Soil Conservation Service
Diamond Hill, Building A
2490 West 26th Avenue
Denver, Colorado 80211

USDA, Soil Conservation Service
Mansfield Professional Park
Route 44A
Storrs, Connecticut 06268

USDA, Soil Conservation Service
Treadway Towers, Suite 204
9 East Lockerman Street
Dover, Delaware 19901

USDA, Soil Conservation Service
Federal Building
401 S.E. 1st Avenue
Gainesville, Florida 32602

USDA, Soil Conservation Service
Federal Building
355 E. Hancock Avenue
Athens, Georgia 30613

USDA, Soil Conservation Service
300 Ala Moana Blvd.
Room 4316
Honolulu, Hawaii 96850

USDA, Soil Conservation Service
Room 345
304 North 8th Street
Boise, Idaho 83702

USDA, Soil Conservation Service
Springer Federal Building
301 North Randolph Street
Champaign, Illinois 61820

USDA, Soil Conservation Service
Corporate Square-West
Suite 2200
5610 Crawfordsville Road
Indianapolis, Indiana 46224

USDA, Soil Conservation Service
693 Federal Building, Rm. 823
210 Walnut Street
Des Moines, Iowa 50309

USDA, Soil Conservation Service
760 South Broadway
Salina, Kansas 67401

USDA, Soil Conservation Service
333 Waller Avenue
Lexington, Kentucky 40504

USDA, Soil Conservation Service
3737 Government Street
Alexandria, Louisiana 71301

USDA, Soil Conservation Service
USDA Building
University of Maine
Orono, Maine 04473

USDA, Soil Conservation Service
Hartwick Building, Rm. 522
4321 Hartwick Road
College Park, Maryland 20740

USDA, Soil Conservation Service
451 West Street
Amherst, Massachusetts 01002

USDA, Soil Conservation Service
Room 101
1405 South Harrison Road
East Lansing, Michigan 48823

USDA, Soil Conservation Service
200 Federal Building & U.S. Courthouse
316 North Robert Street
St. Paul, Minnesota 55101

USDA, Soil Conservation Service
Federal Building, Suite 1321
100 West Capitol Street
Jackson, Mississippi 39201

USDA, Soil Conservation Service
1212 Clinkscales Road
Columbia, Missouri 65201

USDA, Soil Conservation Service
32 E. Babcock
Bozeman, Montana 59715

USDA, Soil Conservation Service
Federal Building, Rm. 345
100 Centennial Mall, N.
Lincoln, Nebraska 68501

USDA, Soil Conservation Service
U.S. Post Office Building
50 S. Virginia Street
Reno, Nevada 89505

USDA, Soil Conservation Service
Federal Building
Madbury Road
Durham, New Hampshire 03824

USDA, Soil Conservation Service
1370 Hamilton Street
Somerset, New Jersey 08873

USDA, Soil Conservation Service
517 Gold Avenue, S.W., Room 3301
Albuquerque, New Mexico 87103

USDA, Soil Conservation Service
U.S. Courthouse and Federal Bldg.
Room 771
100 South Clinton Street
Syracuse, New York 13260

USDA, Soil Conservation Service
Federal Office Building, Rm. 544
310 New Bern Avenue
Raleigh, North Carolina 27611

USDA, Soil Conservation Service
Federal Building, Room 270
Rosser Avenue and Third Street
Bismarck, North Dakota 58502

USDA, Soil Conservation Service
Room 522
200 North High Street
Columbus, Ohio 43215

USDA, Soil Conservation Service
Agricultural Center Building
Farm Road and Brumley Street
Stillwater, Oklahoma 74074

USDA, Soil Conservation Service
Federal Building, 16th Floor
1220 S.W. Third Avenue
Portland, Oregon 97204

USDA, Soil Conservation Service
Federal Building & Courthouse
Federal Square Station
228 Walnut Street
Harrisburg, Pennsylvania 17108

USDA, Soil Conservation Service
46 Quaker Lane, Alderie Complex
West Warwick, Rhode Island 02893

USDA, Soil Conservation Service
Strom Thurmond Federal Building
1835 Assembly Street, Room 950
Columbia, South Carolina 29201

USDA, Soil Conservation Service
Federal Building
200 4th Street, S.W.
Huron, South Dakota 57350

USDA, Soil Conservation Service
U.S. Courthouse, Room 675
801 Broadway Street
Nashville, Tennessee 37203

USDA, Soil Conservation Service
W. R. Poage Federal Building
101 S. Main Street
Temple, Texas 76501

USDA, Soil Conservation Service
4012 Federal Building
125 South State Street
Salt Lake City, Utah 84147

USDA, Soil Conservation Service
1 Burlington Square, Suite 205
Burlington, Vermont 05401

USDA, Soil Conservation Service
Federal Building, Room 9201
400 North 8th Street
Richmond, Virginia 23240

USDA, Soil Conservation Service
360 U.S. Courthouse
West 920 Riverside Avenue
Spokane, Washington 99201

USDA, Soil Conservation Service
75 High Street - Room 301
Morgantown, West Virginia 26505

USDA, Soil Conservation Service
4601 Hammersley Road
Madison, Wisconsin 53711

USDA, Soil Conservation Service
Federal Office Building
100 East "B" Street
Casper, Wyoming 82601

USDA, Soil Conservation Service
Federal Office Building, Room 633
Chardon Avenue
Hato Rey, Puerto Rico 00918

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