# Agriculture in the Environment

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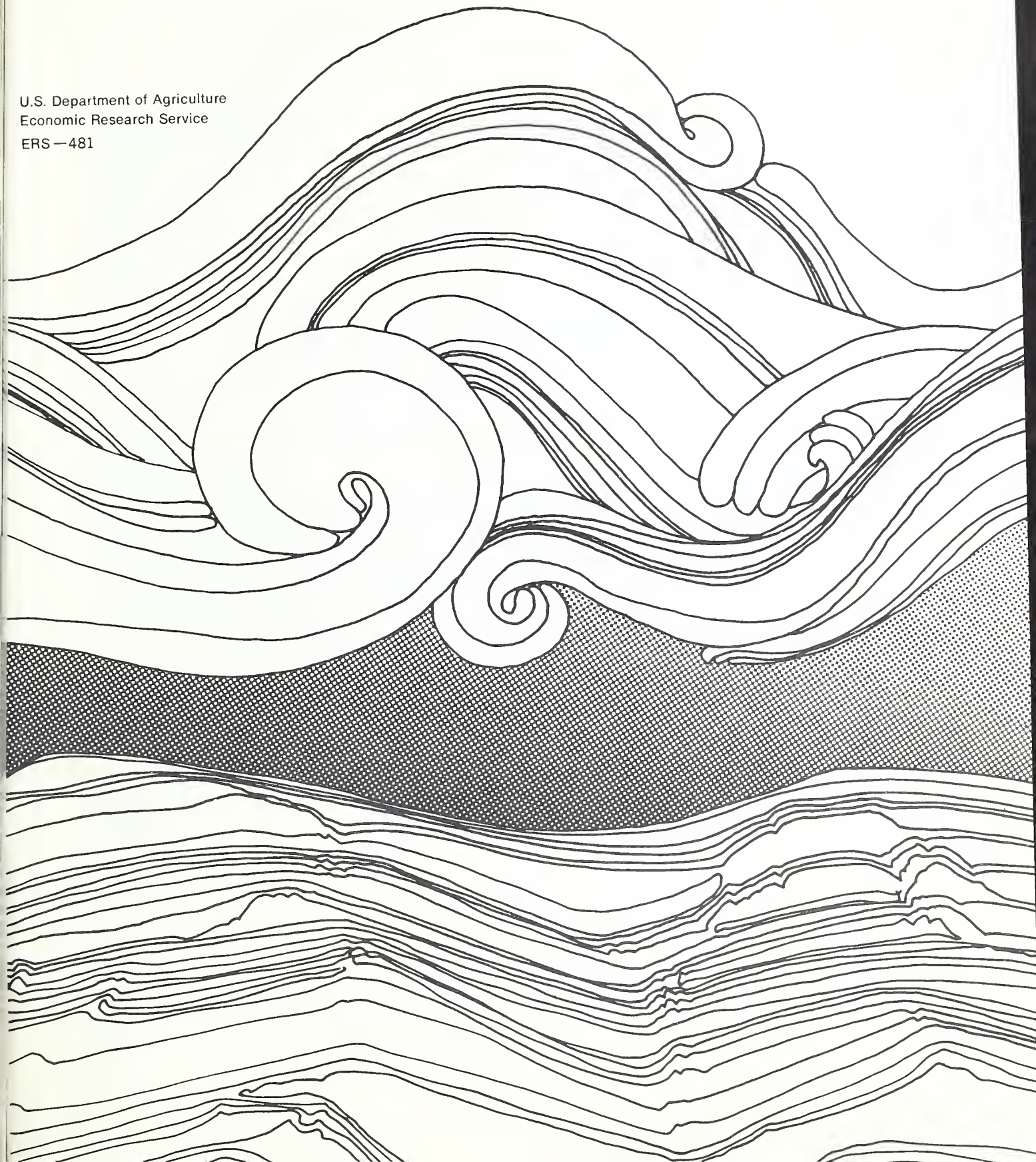

## PREFACE

A groundswell of public concern about the declining quality of our environment has swept the nation. People are demanding an end to further degradation. They want improved standards of environmental quality, better resource allocations, more tasteful developments, and greater access to recreational opportunities and natural environmental experiences. This concern transcends traditional conservation goals and has stimulated new interest in the public effects of private actions. Agriculture has major interests in the total environment; it both affects and is affected by levels of environmental quality.

The Economic Research Service provides socio-economic information on a broad range of environmental problems. The series of articles presented here from The Farm Index are assembled for separate release by the Natural Resource Economics Division because of the urgency and importance of environmental quality to both the researcher and the general public. Materials for these articles were provided by David E. Brewster, Economic and Statistical Analysis Division; and Roger W. Strohbehn, Robert C. Otte, Joseph P. Biniek, and Melvin L. Cotner, Natural Resource Economics Division.

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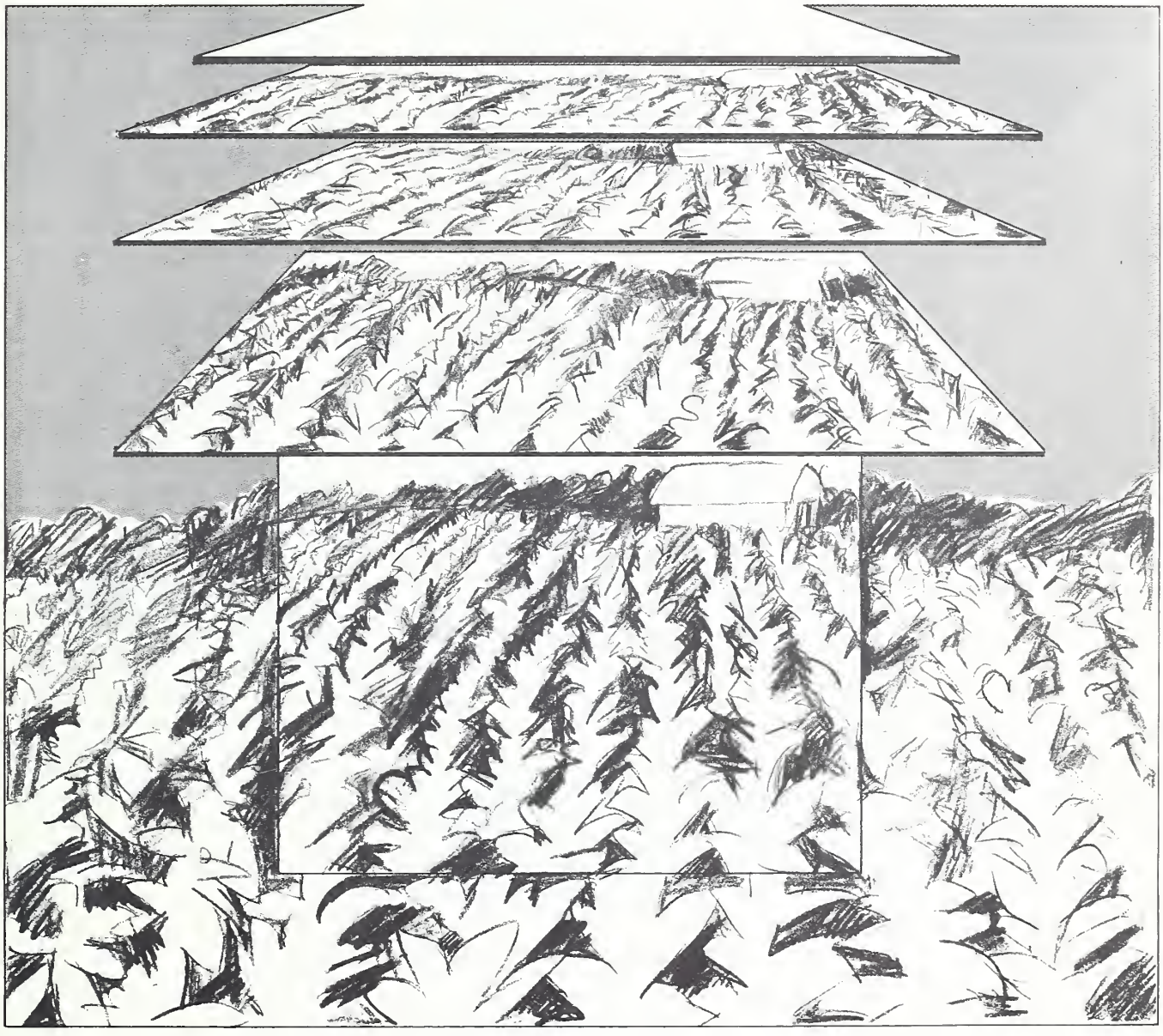


"The earth is fast becoming an unfit home for its noblest inhabitant," warned George Perkins Marsh in the mid-1800's. One of America's first conservationists, Marsh said that unless somebody did something, man would soon reduce the world to "a condition of impoverished productiveness, of shattered surface, of climate excess, as to threaten the depravation, barbarism and perhaps even extinction of the species."

The conditions that Marsh deplored had been centuries in evolution, and in America went back to the exploitation of the land by our earliest settlers. By them, the land was seen as an essential provider of food, and later as an equally essential source of profit. The land had to be cultivated quickly . . . and by

whatever means possible.

As they migrated westward, Americans relentlessly farmed the land for survival, generally at the expense of nature's protective ground cover. In the West, it was the wind more than water that was the major force of erosion. In 1935—during the Dust Bowl—great clouds of middle America's soil were hanging over Washington, D.C. and blowing into the Atlantic.

Until the 1930's, relatively few people were interested in the environment. Washington and Jefferson were early conservationists who, among other things, promoted crop rotation as a way to preserve the soil's natural fertility. Several lesser known men such as Jared Elliot, Samuel Dean, and Solomon Drown also argued for the conservation of our natural resources. Following them, Theodore Roosevelt's administration (1901–1909) took a general interest in conservation, especially preservation of our natural forests and the irrigation of arid lands.

But in the thirties a large segment of the citizenry was aroused by the abuse of the land. Depression, drought, and the Dust Bowl set the stage for launching a set of emergency and long-range programs aimed at reclamation, improved farming, and watershed development.

Agencies such as the Civilian Conservation Corps, the Soil Conservation Service, and the Tennessee Valley Authority didn't immediately solve problems that had been smoldering for a couple hundred years. They did, however, open the way to a successful attack on what had been America's greatest environmental threat—the misuse of its natural resources.

About the time that the country was generally waking up to the danger of erosion and mismanagement of the land, agriculture's ecological problems were only beginning.

In 1939, a Swiss chemist formulated a synthetic compound called "dichlorodiphenyltrichloroethane." Most people didn't worry about the jaw-busting name. They just called the compound DDT.

During World War II, DDT proved a Godsend. In 1944 it was the key factor in breaking a typhus epidemic in Naples. From then on it was used extensively to control lice and mosquitoes. Wartime problems with typhus and malaria were significantly reduced as a result.

After the war, factories that had been turning out DDT for the military began to produce it for farmers. Until about 1945, synthetic organic chemicals accounted for only about 10 percent of the total dollar sales of farm pesticide chemicals. Today, synthetic organic pesticides account for more than 90 percent of the pesticides produced.

DDT, of course, has not been the only insecticide on the market. Nor has it been the only chemical aid sold to farmers. The use of fungicides has also increased in the past couple of decades. And herbicide sales have gone up faster than insecticides *or* fungicides. Similarly, new chemical fertilizers have found expanding markets.

The problems resulting from these chemicals are well known—the increasing resistance of insects to pesticides, chemical buildups in streams and the soil, and damage to wildlife.

But for years, the use of chemicals by farmers has been essential to assure abundant harvests of high quality.

In monocultures, a pest or disease attack can spell disaster unless the problem is immediately controlled. The corn blight that moved into parts of the South and the Midwest last summer provided an eye-opening example.

Precisely how much of our agriculture's progress has been due to use of chemical fertilizers and pesticides would be hard to determine. Overall, however, crop production since 1940 has gone up 55 percent and livestock output, 66 percent.

In the case of livestock, developments in engineering and management systems, and other technological advances, have enabled farmers to feed large numbers of livestock in restricted areas. Beef feedlots have been greatly expanded and there's been a shift toward large scale dairy, egg, swine, turkey, and broiler enterprises.

But progress in livestock production has also created a mammoth waste disposal problem, much in the same way as higher crop yields have been accompanied by fertilizer runoff and pesticide residues.

A 1,400-pound cow produces about 10 tons of manure a year. The Nation's livestock collectively produces in the neighborhood of a billion tons of manure annually. As the number of livestock operations with large concentrations of animals increases, the problem of safely disposing of the animal waste becomes more crucial. Adequate disposal systems for the economical handling of large volumes of manure at specific locations have not been developed.

The salting up of soils through irrigation is another worrisome area with many imponderables.

Without adequate drainage to carry irrigation water below the plants' root system, salt content in the soil builds up and crop yields suffer. And when drainage *is* sufficient, there may be an increase in salinity levels in streams and other water bodies.

In California, the Salton Sea—65 years ago a fresh water lake—is now slightly saltier than the ocean as a result of the inflow from irrigation systems. If the salt concentration goes much higher, the hatchability of fish eggs will be adversely affected, as will the future of water-based recreation in the Imperial Valley.

Still another problem—the erosion of soil by water—is now less troublesome than it was before the widespread use of certain conservation practices. Nevertheless, according to one estimate, 3 billion tons of sediment are being deposited each year in this Nation's reservoirs and valleys. Another 1 billion tons are carried by rivers to the ocean.

Silt-laden water bodies not only endanger fish and wildlife, but also create real problems for hydroelectric plants and other industries needing a clear water supply.

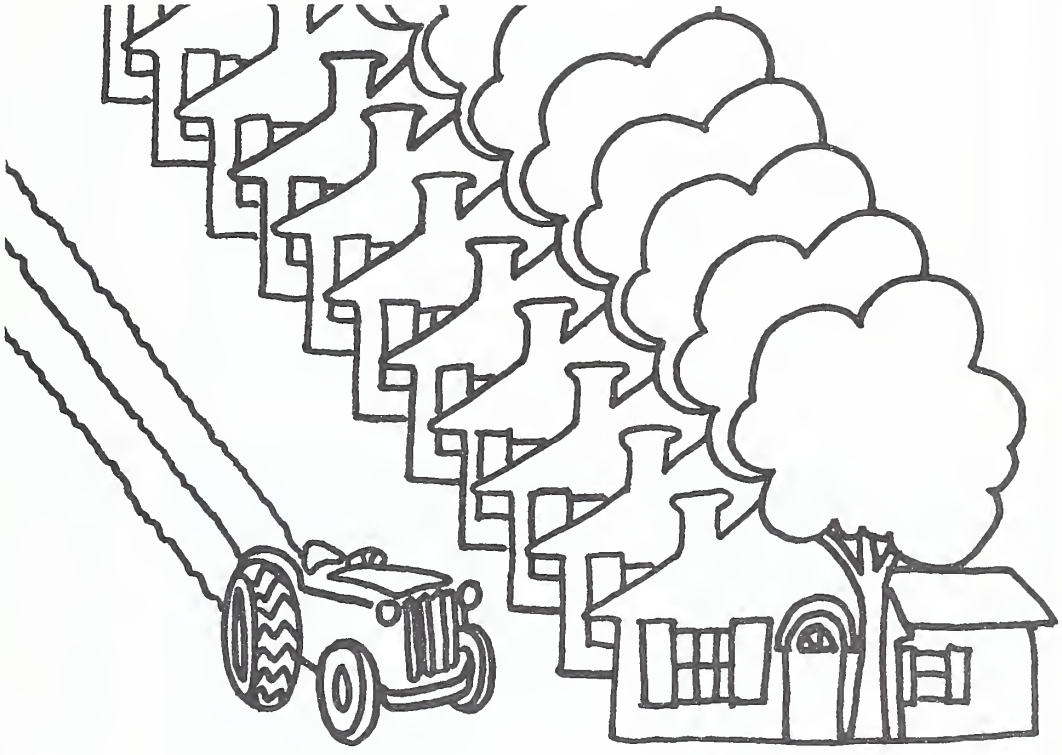
Many of the environmental problems that have developed in agriculture since World War II still seek solution. Research work, however, is going on continuously—especially in the pesticide area. With the restrictions now placed on chemicals, the need for new controls is pressing.

Scientists are therefore intensifying their studies of nonchemical ways to control insects, including male sterilization, use of trap devices, the introduction of natural predators to destroy harmful plants and insects, and the development of new plant varieties resistant to disease and insect pests—to name only a few.

But all this work takes time, and a lot of money for research. For example, for such crops as tomatoes and wheat, scientists need as many as 10 years to breed resistant varieties and to produce enough seed for commercial use.

Not only is research needed on biological and physical aspects for improving the environment, but also on economic and social factors that may help determine priorities for programs to upgrade environmental quality. Examples: Research to more carefully estimate adverse effects of all types of waste disposal; economic analyses of alternative pollution abatement methods; and evaluation of different incentive systems to encourage private action for the public interest.

Whatever the method of pest control, and whatever changes are brought about in other production techniques and land use practices—clearly agriculture and environmental problems will continue to be inseparable.



# Using the Land

About 1½ million acres have been dropping out of our cropland base each year.

During the 1945–64 period, 54 million acres were abandoned or shifted to noncrop uses. But for every 2 acres that went out, about 1 acre of new cropland was developed. So, on balance the annual reduction came to

roughly 1.4 million acres.

However, the land drain is not as bad as it looks. Much of the new land is more productive than that abandoned.

Overall, production increases per acre since the 1940's have more than offset the shrinkage in farmland.

Most significant, the production gains have been outstripping our population's growth rate, currently around 1 percent a year. Population during 1950–70 expanded one-third . . . crop production by over one-half . . . and the per capita agricultural output by 6 percent.

Right now about one-fifth of the Nation's land area is used for crops, or roughly 430 million acres. Another 640 million consists of grassland pasture and rangeland, although some of this has very low carrying capacity for livestock.

But what about next year, and the next 25 or 50 years?

"In the judgement of competent authorities," said Agriculture Secretary Clifford M. Hardin, "the United States has the land, and the ability, to satisfy the food requirements of a population perhaps double the size of today's, provided we plan the use of the land wisely.

"A crucial question arises, however, and policy makers must keep it constantly in mind. It is this: In planning for greater economic, urban and industrial growth, how do we preserve our better farmlands for future needs and at the same time assure adequate land areas for other open space uses?"

Looking at recent trends in land use, it's apparent that urbanization favors the use of the better farmland. Also, a fair-sized chunk of the better quality land is located in those counties within Standard Metropolitan Statistical Areas (SMSA's)—the ones in or nearby a city or community with at least 50,000 people.

In 1964, by the latest data available, the SMSA's had some 17 percent of total farm numbers, and 14 percent of the harvested cropland. The SMSAs' also contained about 15 percent of the better land, i.e., of Land Use Capability Classes I, II, and III.

The annual conversion of land to urban uses is around 420,000 acres on the average. Most of this is former cropland, and much of it, probably of Classes I–III. Nationwide estimates have not been made, but a study of urbanization in 98 northeastern counties showed that about 80 percent of the converted land fell into this category.

In the 1950's and most of the 1960's, it was population pressure and high incomes—coupled with readily available mortgage money—that led to large shifts of rural land to urban use. Financing difficulties reduced the level of urban expansion in the late sixties.

How much farmland that urbanization will swallow in the seventies is anybody's guess. But urban uses per se are only one part of this story. A variety of other uses also compete for rural land—

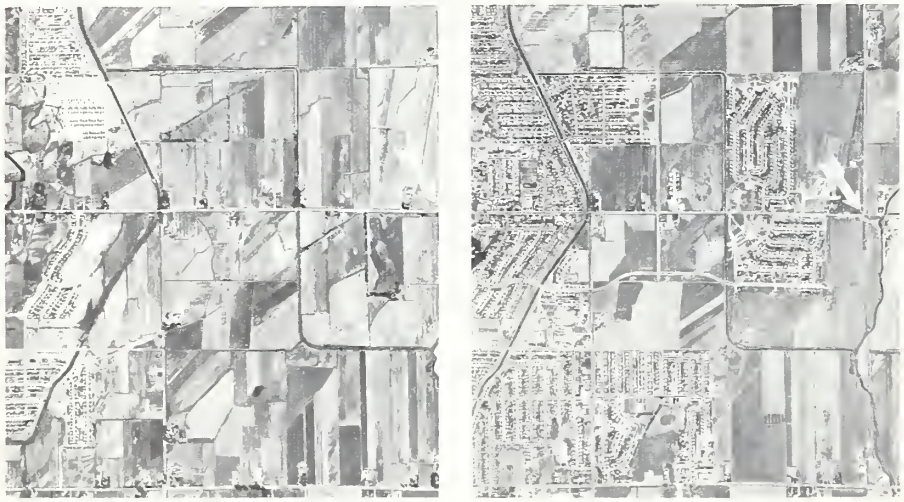
*Highways and airports.* The Interstate Highway System begun in the 1950s' will be completed by the mid-1970's, so the conversion of land to highways may have reached a temporary zenith. Land takeover for airports has increased, but the acres involved are relatively small. Together, highways and airports outside urban areas use some 160,000 acres of new land each year.

*Recreation.* This has been taking ever-increasing quantities of land. Sales of boats, sleeping bags, and tents, have gone up phenomenally in recent years. Travel trailer sales rose tenfold between 1956 and 1966. An estimated 2 million families now own cottages, cabins, and second homes. Over 30 million acres are in national and State parks. Expansion of recreational areas and wildlife refuges in the next decade may involve considerable acreages, but much of this will have only limited direct public use and little of it will come from cropland.

Overall—recreational and wildlife and wilderness uses do not seriously compete with agriculture for land. Most of the land taken for such uses has terrain or drainage features making it unadapted to agriculture. Some competition occurs when wetlands having an exotic ecology or serving as habitat for waterfowl, are drained for agricultural use.

*Water control.* Reservoirs claim about 420,000 new acres each year. The amount has been going up with population.

*Surface mining.* It takes a sizeable bite and leaves ugly scars. Each year

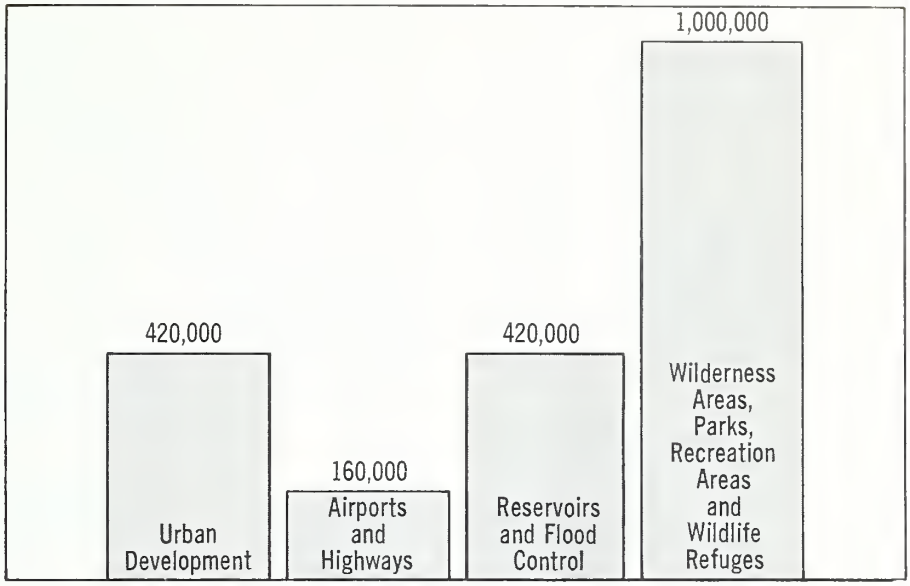


Urbanization of this farmland near Idaho Falls, Idaho, shows a typical development pattern for high-value irrigated cropland. Settlement is dense, and the land is kept in production until actually converted to urban use. At left, in 1951; right, 1966.

the disturbance comes to something over 150,000 new acres, most for excavation or pits and waste or spoil disposal. The rest is taken by mine access roads and exploration activities. As of last year, the total came to over 4 millio acres. However, about a million acres of this can be recovered by regrading and revegetation.

The immediate future will probably see an expansion of surface mining because of the rapid demand for electrical power, slow progress in developing nuclear power, increasing costs of deep mining operations, and shifts to low-sulfur coal to minimize air pollution. Also, exports of coal, particularly to Japan, have been picking up in recent years.

**2 MILLION ACRES A YEAR ARE CONVERTED TO NONAGRICULTURE USES**




*Federal facilities and national defense installations.* For the most part, the acreage has declined slightly since World War II with the disposal of small amounts of surplus acreage. This decline is continuing as military installations are closed for economy reasons; but the acreage is small, and many of the facilities are within the limits of urban areas.

Abandonment and shifts to other uses occurred largely in the States south and east of the Corn Belt, excluding the Delta and southern Florida. Cropland has been converted to grass or forest or abandoned, mainly because of low fertility and features of the terrain not adapted to efficient use of modern machinery.

While all this was happening, agriculture since the mid-1940's picked up an average of well over a million acres a year. The new cropland showed up in several well-defined areas.

Reclamation in Florida was associated largely with combination drainage-irrigation projects, in the Delta with drainage and clearing and in the Texas High Plains, California, and Washington with expanded irrigation facilities. Expansion in northern Montana was owing to improved dryland farming techniques, and throughout the Corn Belt to small-scale drainage, clearing, leveling, and conversion of pasture to cropland. Most of this "new" cropland is more productive than that abandoned.

Though our land resources appear adequate to provide ample food supply for many years to come, certain developments would alter the outlook.

For one, the past increases in per-acre yields are attributed to a number of factors—improved varieties, higher use of fertilizer and pesticides, the elimination of less productive land from cropping, and land improvement practices such as drainage and irrigation.

The economists do not have at hand the information necessary to assign to each of these factors its contribution to overall growth in output. However, this much is evident: Future per-acre production gains of, say, 2 percent per year would depend to a considerable degree on continuing increases in uses of farm chemicals on land. If it becomes necessary to curtail usage of chemicals, per-acre yields would be less, and more land would be required to achieve a given level of production.

On the livestock side, questions are being raised about how much beef demand will increase and whether pasture and rangeland would be sufficient to carry all the cattle needed.

Although the trend has been toward greater consumption of grain concentrates in mixed feed rations, demand for beef has been growing even faster than the utilization of grain concentrates. Thus, greater amounts of roughage from pastureland will be required.

One possibility for filling the bigger needs for roughage is to use for pasture the land retired from crop production. Much of this land has higher carrying capacity—if properly developed—than rangeland and pasture now used for grazing. According to projections of the Water Resources Council, the area in permanent pasture could increase to 649 million acres (48 States) from the 640 million of 1964.

The long-range picture for exports also harbors uncertainties. The acreage equivalent used to produce export commodities has varied widely over the past 20 years, from a low of 31 million acres in 1953 to a high of 77 million in 1963.

Barring sharp increases in exports, there will be sufficient land resources to accommodate them. But

exports are difficult to project because of the unpredictable changes in the import and export policies of the world's trading nations, and in the unforeseeable changes in the technologies used by the developing countries.

The evidence to date indicates that much of the land is *not* being used wisely. The same can be said for other exhaustible resources—such as the water bodies needed by widlife and for recreational uses. Sometimes, the abuses to the land can be rectified:

On a busy summer weekend 10,000 tourists pass through the town of Woodruff, Wisconsin, population 900. Few stop to see Snake Lake. "Snake Lake is an eyesore," said the conservationists. "Nuisance blooms of algae and duckweed appears throughout the summer. Oxygen depletion has killed most of the fish."

Snake Lake is changing, however. The concerned citizens of Woodruff, working with the University of Wisconsin's Extension Service and the Upper Great Lakes Regional Commission, demolished the old sewage plant that caused the lake to become polluted. Then they pumped the lake of its water, filtered out the contaminates through sandy soil in a nearby field, and the lake is now being replenished with crystal-clear water.

Asked why he was involved in this project, one Snake Lake resident replied: "Well, in the interest of conservation. Here's a lake that has good possibilities of being salvaged or reclaimed. And I have time now that I'm retired, so I saw an opportunity to put something back in the kitty, so to speak."

This kind of local initiative, if carried out to the length and breadth of our 50 States, might soon bring an end to the "environmental crisis."

It is also true that Snake Lake encompasses a mere 14 acres, by contrast to the millions of square miles being paved by the Nation's highways and housing complexes. Unlike Snake Lake, much of this vast area cannot be readily recovered, if at all.


Environmental quality is not priced like a loaf of bread. You can't buy 30 cents worth. It nevertheless bears a price tag—a two-sided one.

One side shows the damages caused by pollution and the adverse effects on society. The other side reveals the cost of correcting and preventing the unfavorable alteration of our surroundings.

Assuming the decision has been made to improve the quality of the environment, one question in particular wells to the surface. It is "Who pays for what?" Somebody has to put up the hard cash to buy a cleaner environment.

To the thinking of some people, industry or anyone else who pollutes should pay for pollution abatement. Others claim the government must assume the financial responsibility. Still others say those who benefit must pay.

Debate centers around not only *who* pays, but *how much?* In some cases, a rough idea of potential costs can be gotten from estimates of pollution's damages.

For example, damages from air pollution add an estimated $800 million a year to the tab for commercial laundering, cleaning, and dyeing of fabrics . . . $100 million a year to the costs of painting steel structures . . . and $40 to $80 million annually to costs of air travel when planes must be rerouted due to poor visibility.

By one estimate, air pollution's damage to crops and livestock comes to around $500 million a year.

But the price tag on *agriculture's* pollution of the environment is often a blur.

Nearly everyone would agree that foul odors emanating from feedlots are aesthetically insulting. Moreover, airborne ammonia volatized from cattle urine can pollute water bodies located miles downwind from a feedlot. Absorption of airborne ammonia by surface waters can cause excessive enrichment of lakes and rivers, which in turn causes eutrophication.

But the same airborne ammonia also enriches range lands and fosters lush vegetative growth. It can increase production, reduce erosion and benefit both domestic and wildlife habitats.

In other instances, there can be no doubt about the adverse and costly effects of agricultural pollution. In Maryland, for example, 800 acres of oyster and clam beds had to be closed down because of bacterial contamination. The source was traced to a runoff from a large cattle feedlot. The cost to Maryland's eastern shore economy, which depends heavily on the fishing industry, was estimated at a half million dollars by that State's Health Department.

By and large it is difficult to pinpoint the cause of pollution when the pollutants enter the ecosystems from many sources. The costs of abatement are equally difficult to add up or to allocate among the offenders.

Mercury, to illustrate, escapes from oil wells, sulfur mines, coal mines, mineral smelters, burning fuels and enters the atmosphere. Rain and snow filter the air of pollutants, returning them to the rivers, lakes, oceans and to the land. Mercury has been used as fungicides and in paper making. Dentists use it for teeth filling.

The price tag is largely nonexistent when we speak of mercury pollution. We know little about mercury, aside from the fact that a concentration in body tissue can be deadly.

Agriculture is often blamed for nitrogen pollution. Yet nitrogen makes up 78 percent of the atmosphere and is present in all living tissue. Burning of fossil fuels, life processes, and the decay of organic material release concentrated forms of nitrogen into the ecosystem. The price tag for nitrogen pollution control also is being vigorously debated.

Of all of agriculture's problems with pollution, the one that appears the most costly to overcome is disposal of solid wastes. These account for over half the solid wastes produced in the United States. True, not all the 2.3 billion tons of agricultural wastes can be considered pollutants. And frequently the wastes can be disposed of at little or no cost, such as those from range cattle and certain crops. However, costs to dispose of wastes from intensive livestock operations can be high, depending on the location of these operations and other factors.

The annual 2.3 billion tons of agricultural wastes far exceed the 250 million tons contributed by residences, commerce, and institutions. Of the 250 million, about 190 million are collected by public agencies and private refuse firms. The disposal cost runs about $18 per ton—or $3.5 billion a year.

All things considered, it is clear that the total cost of getting rid of all types of agricultural pollution will run well into the billions.

### *If 2,4,5–T Were Banned*

A just-published study estimates that a ban on the phenoxy herbicide 2,4,5–T would increase costs to farmers and other users by $52 million to $172 million.

The lower figure would be the case if 2,4,5–T were banned and all other registered herbicides were available as alternatives. Of the $52 million, $32 million would represent added costs to control weeds and brush on farms. Other domestic users—homeowners, utility companies, recreation and timber industries—would spend $20 million more.

The $172 million assumes no phenoxy herbicides could be substituted for 2,4,5–T. Added expense to farmers is estimated at $44 million, and to nonfarm users, $128 million.

All costs are based on estimated use, prices, and alternatives in 1969.

Not all decisions on environmental quality will be based on economics, however. DDT was first used to protect humans from insects. It saved many lives and eliminated many diseases. Later, it became a major input in producing food and fiber. More recently, it was recognized as having an adverse effect on other parts of the ecosystem and bans were imposed. Monetary values on the saving of lives, or the reduction of illness, have not been established. Neither can such values be placed on the adverse effects—the loss of wildlife and contamination of the food chain. But this example does not suggest we obviate the need for measurement.

Instead, the lessons learned from DDT should encourage a broader sense of economic and social responsibility; an increased awareness of the short-run and long-run implications of our actions; an attempt to determine if such actions and technology are in harmony with biological, social, and economic objectives.

Costs of controlling agricultural pollution are large and will vary widely depending on assumptions as to what is considered necessary, desirable and possible. As understanding of methods and techniques of environmental quality control improve, these costs can be incorporated into economic analysis and improve the decision-making processes.

Obviously, without pollution abatement, society in general will suffer the damages or social costs. These costs range from aesthetic insults to debility and death. They include financial losses, inconveniences and fear of the future.

Some of the pollutants can be reduced at the source, with industry bearing the added costs. Other pollution problems, such as municipal wastes, must be controlled by governments. Additional costs may be covered by government grants, subsidies, or other incentives.

The question of "Who pays for what?" would seem to depend on how clean we want the environment and how much society is willing to pay. It depends on what adverse effects society is willing to accept if steps are not taken to curb pollution. It depends on technological ability to reduce pollution and prevent new forms of pollution.

Finally, it depends on the legal-political and institutional structure: how these facilitate achievement of what is physically possible and of what is economically feasible.

# THE LEGISLATIVE RECORD

Nineteen-seventy was what some observers have described as a "pivotal year" in environmental action. The President signed into law several major pieces of legislation relating to environment problems.

This year, as of early May, there were some 2,500 bills and resolutions on the environment that were pending consideration by the 92nd Congress. A number of bills provide for more controls on the use of agricultural pesticides. Others call for a regional water quality act, a national environmental data system, and an environmental financing authority, to name only a few.

One way or another, some of the legislation being considered—or already passed into law—will affect U.S. farmers, agribusinessmen, and others who help produce agricultural commodities or process or market them. To briefly review some of the laws enacted last year—

*The National Environmental Policy Act* (*Public Law 91–190*). Signed by the President on January 1, 1970, this is perhaps the most significant legislative act relating to the environment. It establishes a national policy on the environment, provides for a Council on Environment Quality and requires that environmental impact statements be prepared for Federal actions.

The general policy declaration in the Act is to encourage a productive and enjoyable harmony between man and his environment; to promote efforts that will prevent or eliminate damage to the environment and biosphere, and stimulate the health and welfare of man; and to enrich the understanding of ecological systems and natural resources important to the Nation.

The Council on Environmental Quality established under the Act started operations on February 1, 1970. In August, the Council published its first annual report. Of particular interest to agriculture were the Council's views on the need to keep attractive rural lands from being consumed by urban development. When considering "what needs to be done," the report stresses intensified research and action approaches to minimize agricultural pollution caused by plant nutrients, animal wastes, and pesticides.

In the transmittal of the Council's report to Congress, the President called for a National Land Use policy and for new approaches to recycle what now are considered wastes. He also included proposals designed to encourage growth in rural areas, small cities and towns.

A provision in the Environmental Policy Act requires that detailed environmental impact statements be submitted by Federal agencies with every recommendation or report on proposed legislation or other major Federal actions that might affect the quality of the environment. The impact statements are submitted to the Office of Management and Budget and the Council on Environmental Quality. About 300 statements are being submitted monthly.

*The Resource Recovery Act* (*91–512*). It provides funds for the construction of improved solid-waste disposal facilities and for demonstrations of area-wide resource-recovery systems. Special studies will be conducted to determine recommended incentives or disincentives to accelerate the recycling of materials from solid wastes, with emphasis on motor vehicle hulks. Success of these studies would improve the rural areas by minimizing their use as auto grave yards.

The law also establishes a National Commission on Materials Policy. The Bureau of Mines is authorized to spend $51 million for research in metal, mineral, and solid waste disposal.

*The Environmental Education Act* (*91–516*). Its purpose is to encour-

age and support the development of new and improved curricula designed to enhance the understanding of environmental quality problems. The Act provides support for education programs at the elementary and secondary school levels, as well as training programs for teachers, public service personnel, and community, labor, industrial, and business leaders and employees. The program is designed to reach a broad target group and, presumably, grants can be made to any public agency or private non-profit organization engaged in environmental quality improvement. The Act provides $5 million this fiscal year, $15 million in 1972, and $25 million the following year.

*The Clean Air Act Amendments of 1970 (P.L. 91–604).* It requires the development of a non-polluting automobile by 1976, authorizes $1.1 billion for research over the next 3 years and authorizes the setting of national air standards. It gives a time schedule for States to establish and enforce a clean air program. Industrial emissions hazardous to public health are subject to mandatory Federal standards. New factories, power plants, and other stationary sources of pollution will be required to use the best control technology available. This legislation provides for citizen suits and provides for a fine of $25,000 per day of violation.

*Public Law 91–617.* This law, an amendment to the Consolidated Farmers Home Administration Act of 1961, broadens the lending authority of the Farmers Home Administration. It permits the use of insured loans to tax-exempt public bodies for sewer and water facilities. It also broadens some of the authority to include county organizations and waste districts, in addition to municipalities. Farmers Home Administration loans and grants are made to groups serving open country and rural towns and villages with population of up to 5,500.

Besides including environmental quality control in his 1970 State of the Union message, President Nixon presented a special message to Congress on the subject. Among other things, he proposed a $4-billion appropriation to cover the Federal share of a $10-billion matching-fund program for waste treatment facilities to be allocated over the next 4 years.

Action was taken, or progress was made, on most of the President's recommendations. In October 1970, the President signed a bill authorizing $1 billion in funds for grants to States for waste-treatment plant construction, and also authorized the use of a $440 million carryover from fiscal 1970 funds.

Executive Order 11574 directed the Corps of Engineers to implement a system of Federal permits for industrial discharges into nearly all U.S. waterways. The authority for the permits is an old 1899 law known as the Refuse Act. Permits for all new discharges will be required immediately. Plants already discharging into waterways will have until July 1, 1971, to secure permits.

The applications for permits are expected to provide a catalog of the wastes that industry is putting into the Nation's rivers, lakes, and estuaries. Municipal sewage is specifically exempted from permit requirements. Anyone who points out violations of the Refuse Act is entitled to half of a $2,500 maximum fine specified for violators. More importantly, the Refuse Act can be used to seek antipollution injunctions.

President Nixon in late 1970 pulled together several functions of existing agencies into a new *Environmental Protection Agency.* The role and function of EPA, an independent executive agency, is to: (1) establish and enforce quality standards, (2) conduct research on the adverse effects of pollution and on methods of control, (3) administer grant programs and provide technical assistance, and (4) assist the Council on Environmental Quality on policy matters. EPA will have 10 regional offices and now has 5,600 employees. Its budget is $1.4 billion for fiscal '71.

Among EPA's numerous activities is the regulation and monitoring of pesticides—a function formerly performed by USDA.

Within USDA, Secretary Hardin has established an *Environmental Quality Executive Committee.* The functions of the Committee are to coordinate the Department's responses to Congress, the Office of Management and Budget, and the Council on Environmental Quality; and to initiate and review legislative and policy proposals pertaining to environmental matters. The committee also provides guidance to Departmental information and training programs.

The Department, through its Executive Committee, currently is reviewing its programs to determine how they can be modified to assist rural America in meeting its problems and fulfilling its responsibilities for maintaining a quality environment.

Secretary Hardin is seeking new directions for the Department's program for the environment. The Department's environmental program for the 1970's, as it is now taking shape, will include five chief elements:

- Identification, retention, and protection of land for agricultural production, with particular concern for Class I and II land, since it is of limited supply.
- Designing of new approaches to the use of land released from agriculture for esthetic and recreational purposes, especially around population centers.
- Stimulation of selected small- and medium-size growth centers around the Nation.
- Intensification of efforts to determine the capacity of land to absorb wastes and to design means of converting wastes into beneficial uses.
- Finally, modification in the use of agricultural chemicals, to include a number of biological control mechanisms that would replace the more toxic chemicals.

UNITED STATES DEPARTMENT OF AGRICULTURE
WASHINGTON, D. C. 20250

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