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ENVIRONMENTAL AND RESOURCE ECONOMICS

Environmental Quality in a Growing Economy

Essays from the Sixth RFF Forum

Henry Jarrett

ENVIRONMENTAL QUALITY
In a Growing Economy

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by

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ENVIRONMENTAL QUALITY
In a Growing Economy

EDITOR'S INTRODUCTION

Captain Donaldson, a retired glassblower who used to keep a small boatyard on the Potomac about fifteen miles below Washington, was, at the time I knew him late in his life, deeply exasperated at the condition of the river. "When I first came here," he would say, glowering at the turbid, greenish-brown water, "you could see a corpse in ten feet." The Captain's lament of nearly twenty years ago anticipated a far wider concern that was to come later.

All over the country more and more of the pressing problems and issues of all natural resources, not just of water, are coming to be those of quality rather than quantity. This is true not only of the United States, with which this book is primarily concerned, but also of most of the other countries that have reached an advanced stage of economic development. The growth of interest in quality has led to inauguration of large-scale federal efforts to maintain or improve the natural environment, and to many efforts toward the same end by state and local governments and private groups and individuals. The goals of healthfulness and beauty are, in fact, keystones in President Johnson's concept of the Great Society.

The change in emphasis has come quickly. As recently as 1951, when President Truman established the President's Materials Policy Commission, fears of natural resource scarcity were uppermost in the minds of most people. The Commission's main assignment was to inquire into whether there would be enough food and industrial raw materials at

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The twelve essays in this book were originally presented as papers at the Sixth RFF Forum, March 8 and 9, 1966. All of the papers have been revised by their authors prior to publication. Through the co-operation of Edward A. Ackerman, executive director of the Carnegie Institution, the Forum was held in the Institution's auditorium in Washington, D.C. An invited audience of about 250 attended. The Forum was planned by an RFF staff group led by Allen V. Kneese, who is director of RFF's research programs in water resources and in quality of the environment. The sessions were chaired by Joseph L. Fisher, RFF president.

reasonable prices over the next twenty-five years to support continued economic growth and meet the requirements of national security.

Today, in the middle 1960's, many of the worries over supply have subsided. For the next generation—and probably longer—there are few indications of widespread and persistent shortages of materials. Instead, the most troublesome questions are likely to concern the cleanliness of water and air; the effects of heavy use of pesticides upon soil and water; availability of suitable surroundings for outdoor recreation; the beauty of the countryside; and the effects of urban living upon the human body and spirit. These make a mixed bag of problems, but all of them can come under the tent of a single phrase: "quality of the environment."

It is of course true that the new emphasis on quality is more of a relative than an absolute change. Not all of the environmental problems were born yesterday: water pollution has been a live issue for decades, and so has air pollution in Pittsburgh, Chicago, and a few other cities; the history of national parks goes back over nearly a century, and that of some municipal parks even longer. Neither has the threat of scarcities of natural resource materials been entirely banished; even in the United States and other economically advanced countries, painful shortages of a temporary or localized nature can be expected before the end of the century. And in some of the less-developed countries many of the most urgent resource problems today remain those of scarcity.

For the more distant future everywhere, Malthus still casts a long shadow. Few economists care to make detailed projections for more than forty or fifty years, and broad opinions on prospects for the next hundred years or longer are mixed. It is interesting to note that some of the contributors to this volume, though agreed on the urgency of quality problems in the near future, are dubious of the longer-range prospects for resource adequacy; others are more hopeful. In any event, it is quite clear that if national and world populations continue to increase at anything like present rates, it is only a question of time until pressures upon both environmental quality and supplies of natural resource products become intolerable.

But even when all the important exceptions and qualifications are made, the fact remains that the recent emergence of problems of quality as a widely felt concern has created a new situation: understanding its nature and devising policies and programs to deal with its many manifestations will tax the ingenuity of the American people.

An instinctive first response to many of the signs of lowered environmental quality—smoggy atmosphere, polluted streams, noise, ugly slums, automobile graveyards, land skinned by strip mining, and so on through

a long list—is to want to turn the clock back to a simpler, less crowded age. Then one realizes the futility of such a wish. The underlying causes of these discomforts and hazards are to be seen in the same statistics that most of the time are hailed as indicators of economic growth. A few outstanding examples are given below in the form of a table. More people (especially the growing majority living close together in urban areas) with more money to spend, more mobility, and more leisure, along with more production and consumption per person, result not only in a flourishing economy but also in heavier pressures on the environment—more crowding in cities and on highways, less unspoiled woodland and shoreline, more factory fumes, and more family and industrial wastes to dispose of. The welcome and the unwelcome results are two sides of the same coin. If the RFF projections from 1980 and 2000 are anywhere near the mark, the forces of economic progress working to degrade the environment will become steadily stronger.

	U.S. Population (millions)		Automobiles in use (millions)	Personal Consumption Expenditures (billions 1960 dollars)	Federal Reserve Board Index of Industrial Production (1957=100)
	Total	Urban			
1920	105.7	54.2	8.1		26.0
1940	132.1	74.4	26.2	158.9	43.6
1960	179.9	125.0	59.3	328.9	108.0
1980	*245.0*	*193.0*	*120.0*	*662.0*	*249.0*
2000	*331.0*	*279.0*	*243.0*	*1,320.0*	*564.0*

In the 1920 row the figures for automobiles in use is for 1921. The italicized figures for 1980 and 2000 are middle-range projections from *Resources in America's Future*, by Hans H. Landsberg, Leonard L. Fischman, and Joseph L. Fisher (Baltimore: The Johns Hopkins Press for Resources for the Future, 1963).

Population and economic activity have been growing in the United States for two centuries. Yet unlike worry over natural resources supply, which in many instances has developed gradually, much of the serious concern over environmental quality has arisen only recently. Many of the problems of this kind have seemed full-grown from the start; this appears to be largely a function of scale. Up to a certain level of concentration, disposal of wastes, disfigurement of the landscape, and congestion are, at worst, local irritations. Air, water, and earth-room can absorb a lot without great damage. Beyond that point real trouble

ensues; differences of degree create differences of kind. Luther Gulick at the first RFF Forum in 1958 (in a paper later published in *Perspectives on Conservation,* The Johns Hopkins Press) referred to this phenomenon as "the take-off principle."

In contemplating the rural aspects of this principle, I often think of the privy on my uncle's farm in the cut-up Maryland country north of Baltimore where the coastal plain rises up to the Piedmont. This useful structure was perched on the bank of a little stream that chattered past the house and joined a larger creek about a quarter of a mile beyond. When I was a boy, the time of the First World War, this location struck me as pleasant and convenient. Some years later, after learning about sanitation, I used to wince at the memory. Still later, upon recalling that nobody in those days lived on the big creek for four or five miles downstream and the nearest neighbor on the little stream lived two miles up toward the source, I relaxed and could take pleasure in my first-hand experience of the law of concentration and take-off.

Another reason for the change in attitude is that Americans in recent years have demanded much higher levels of environmental quality. (Maybe the good old days were not really so good as they seem in retrospect.) Patient programs of education have undoubtedly accounted for part of the rise in standards, but the strongest push seems to have come from greater affluence: with something left over after buying the necessities, people can afford to take more interest in some of the higher things, whether through larger taxes or larger personal expenditures.

Resource problems of quality differ from those of quantity in several respects, at least two of which profoundly affect people's ways of coping with them.

1. The quality problems tend to be much broader and more open-ended. Most of the quantity problems, difficult though they are, have fairly sharp definitions. Within the accepted rules of the game in our modified free-enterprise economy, how does one obtain a continuing adequate supply of resource materials at relatively low real cost? (Or, in the case of U.S. farm products, how does one deal with at least a short-term surplus?) In any case, the ultimate objective is the production and distribution of rather clearly defined natural resource goods or services that people need or at least will pay for. But when one moves into the problems of environmental quality, the field is wide open. The only absolute limits are those of what is physically possible, and as technology advances it becomes harder to say where those limits lie. The basic question usually is: "What kind of environment do we want?"

How important is it to curb billboards and neon-lighted hot dog stands along the highways? How clean do we really want our air and streams to be? These and scores of other puzzling questions lie close to the surface. One can go deeper and ask whether larger production of material goods is always *ipso facto* a good thing or ask whether man's adaptability over the short term will in the longer run be a blessing or a curse.

2. The solutions to problems of quality, insofar as goals can be agreed on, lie to a large extent outside the influence of the market economy. Despite the extensive degree of government intervention or outright control in the supply and distribution of resource goods and services in the mixed economy of the United States, the free market still is the main mechanism for handling the quantitative side of resource management. Government (federal, state, or local) may impose all kinds of regulations or even go into business itself; still it is primarily through the price system that supplies are produced and allocated. But in matters of quality the market system often functions poorly or not at all. The production, distribution, and use of natural resources often have profound effects upon persons not directly concerned in these activities. Yet such side effects are rarely bought or sold. (The effects can be good as well as bad, although the unfavorable ones get most of the attention.) The most familiar example, perhaps, is dumping of wastes in rivers. The town or factory which does so is using a cheap disposal method from the standpoint of its own profit accounting but the cost to people downstream—either in the form of purifying the water or suffering unpleasant sights and smells—may be high. Other examples are air pollution from automobile exhausts or industrial fumes—cheap disposal methods for both—or the noise that neighbors suffer from the operation of an airport.

The market mechanism doesn't work very well, because in these and similar situations the controlling relationships are not between buyers and sellers. Some redress can be got through civil or criminal law, or government regulation or taxation, but the results have seldom been adequate or even-handed. There is a clear need for more study and experimentation in the field of political and social action.

Written history and archaeological evidence before that tell of a continuous effort to wrest more food and raw materials from the earth. Some say that Western man has laid too much emphasis on materials, though only recently have the great mass of people, even in the most advanced countries, enjoyed the expectation of enough food, clothing,

and shelter. Now that in the United States and a few other developed countries adequate supply seems assured, at least for the near future, the scale of farm and industrial production and of transport, and the spread of urbanization are threatening other human values—the very values that more people are coming to emphasize because they can afford them.

Granting that most of the pressures upon the natural environment have been direct or indirect results of a prosperous and expanding economy, does it follow that further erosion of environmental quality must continue to be the price of further economic gains? There is no pat answer. The most one can say is that continued decline does not appear inevitable. On the hopeful side are a vigorous technology and a capacity—if pressed hard enough—for political innovation and social discipline. On the other side are the difficulty and unfamiliarity of some of the present and prospective problems. Even a tolerable degree of success will not come easily.

It is time to take soundings, as several government and private groups are doing. This was the purpose of the Resources for the Future Forum on Environmental Quality that was held in March 1966.

In view of the limitations of any one symposium—or any one book—the coverage is selective. There is almost no limit to the avenues that might be explored and the distances down each that might be traveled in an exhaustive examination of the problems of environmental quality. The effort here is to touch upon some of the highlights of the current situation, to look at the prospects, and to ask what might be done about them. Six topics were chosen. For each, one expert in his field was asked to prepare a paper and another to respond either by critical comment, development of other aspects of the problem, or both. These papers, as subsequently revised in the light of comment and discussion at the Forum, constitute the essays in this book.

In the first pair of essays, Kenneth Boulding and Harold Barnett open the inquiry with a broad look at how development of natural resources has affected the environment and may be expected to affect it in the future. Mr. Boulding, while recognizing the importance of many near-term problems, takes the long view, with a critical look at goals and values that often are taken for granted. Seeing the advance of technology and the growth of population as forces that are making it increasingly plain that the Planet Earth is a self-contained spaceship with diminishing new sources of materials and less and less room for disposal of wastes, he questions the familiar idea that continuingly increasing pro-

duction and consumption of goods are in themselves desirable. Mr. Barnett, while limiting his horizon largely to the end of the twentieth century, explores the effects of economic growth upon the natural environment, and asks whether the ideal of a competitive self-regulating market will be as useful in the decades ahead as it was in the nineteenth century and the first part of the twentieth.

The second pair of essays deals with almost as broad a subject: effects of the environment upon human health, both physical and mental. René Dubos sees a crucial problem in the contrast between man's biological stability—no perceptible change since our Cro-Magnon forebears—and his formidable capacity to form new social and cultural patterns and to survive, at least for many years, under new conditions. Because of man's adaptability some apparently harmless effects of urban living may begin to take their toll decades later and in indirect ways. Furthermore, who can say whether man's remarkable capacity to adapt will always carry him in what by present values appear to be desirable directions? Leonard J. Duhl, interested mainly in mental health, sees, along with Dr. Dubos, the spread of urbanization as the central issue. Fragmentation, he believes, causes much of the difficulty—a tendency to take a piecemeal approach instead of viewing the complex problem of city living as a whole. As things stand, municipal agencies are intent on only their particular programs and individuals are subject to conflicting pressures from many quarters. He sees need for new institutions to put the bewildering pieces of the picture together.

The fact that many of the economic problems of environmental quality are caused or aggravated by lying outside the market economy raises many problems and possibilities that have not been well explored. Ralph Turvey, noting that the market mechanism fails when economic decisions concerning the use of natural resources do not take account of all the effects of such use, analyzes the nature of the side effects that slip through the slats and suggests possible ways of coping with them. Roland McKean, going farther along a couple of the paths opened by Mr. Turvey, examines the practical problems of establishing criteria and acquiring the information needed in programs that can deal with the principal side effects of resource use.

Establishment of both goals and methods will call for much more knowledge than is now available. The fourth set of essays examines the current state of economic research into the problems of the environment. Allen V. Kneese discusses research goals, progress made toward them thus far, and the major tasks that remain to be undertaken. In the course of his critical survey he cites a number of examples of projects

now under way by public and private agencies, including Resources for the Future. Mason Gaffney, without paralleling Mr. Kneese's detailed material, explores some of the general problems of environmental research in the light of welfare economics, and supplements Mr. Kneese's findings on research gaps with further suggestions of urgently needed lines of inquiry.

What kind of environment do Americans want and how much are they willing to pay for it in money and effort? The fact that modern man has a wide range of choices which must be made without the aid of the semi-automatic functioning of the market heightens the importance of public attitudes that affect political and private action. How are such attitudes formed and how can they be measured and evaluated? These questions are considered in the fifth pair of essays. Gilbert White surveys this broad field that is in the process of changing from an art to a science, noting the progress that has been made and the large amount of work, including fundamental research, that still needs to be done. David Lowenthal steps back a few paces to consider the assumptions that lie behind public attitudes on questions of environmental quality.

Then there are the problems of taking action to maintain or improve the environment. Here public policies and social and political institutions are of great importance. Many of the nation's current policies and institutions date from times of simple technology and a smaller, more rural, population. And although man can change his social patterns profoundly he rarely does so willingly or quickly. Norton Long, in the first of the final pair of essays, reviews the new tasks that confront government at national, state, and local levels and gives special attention to the interaction among them under a federal system. Jacob Beuscher suggests some of the new kinds of governmental machinery that might be used, including joint boards and compacts for interstate action, methods of operation in metropolitan regions, and the role of state courts.

It is clear at a glance that this book leaves out more than it puts in. Several other important aspects of the environmental problem could have been included and those that are covered could have been treated from other viewpoints and in much more detail. Any reader expecting a comprehensive account of the state of the natural environment in the United States in the 1960's, of the events that brought things to their present pass, or of the dangers and opportunities that lie ahead will not find it here. What he will find is a wide-ranging collection of impres-

sions, interpretations, and reports of research findings by scholars of varying interests and experience who have given years of thought to one or another of the salient pieces of the problem. As a collection, the essays should contribute to a fuller understanding of what has been happening to land, water, and air in the United States, particularly in cities and suburbs. It should also contribute to an appreciation of how much needs to be done to make this country a better place to live in, and a better idea of how groups and individuals can go about doing it.

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Resources for the Future