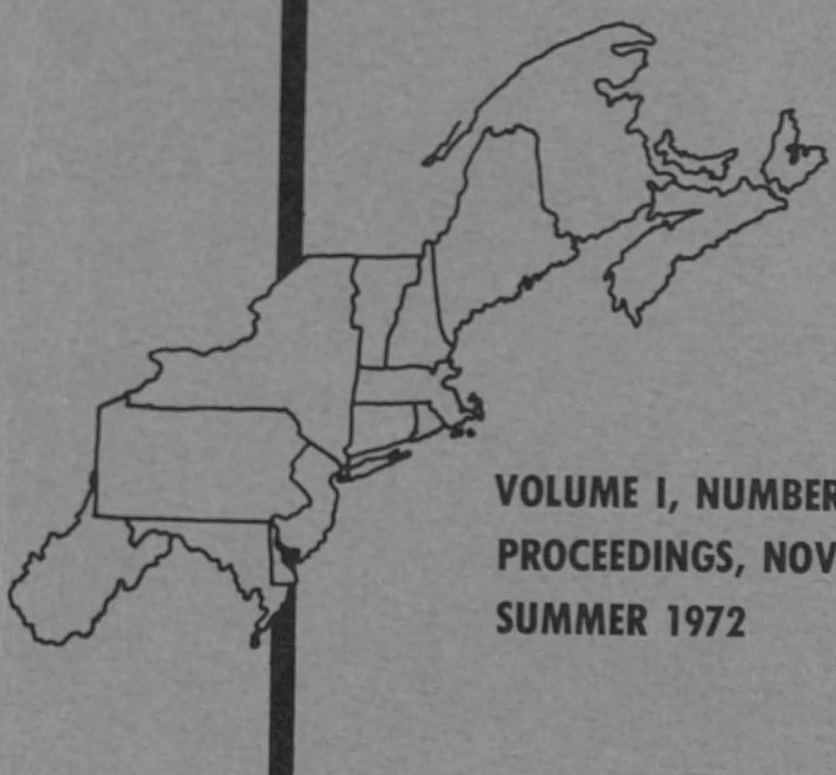
JOURNAL OF

Northeastern Agricultural Economics Council



VOLUME I, NUMBER I
PROCEEDINGS, NOVA SCOTIA
SUMMER 1972

ENVIRONMENTAL ECONOMICS: CHALLENGE TO TEACHING

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Environmental quality, through what some have described as a new Conservation Movement, has captured public awareness in the past three to four years. Public policy decisions affecting the environment are receiving increased attention, and economic information is a crucial input to such policy. We, both as citizens and as professionals, must look ahead and prepare to grapple with environmental problems for years to come.

Our Departments and the Environmental Movement

"Agricultural Economics" is the name which, in some form and with many modifications, has characterized most of our departments and professional associations over the past decade or more. But at the same time that agriculture reigned in title, environmental involvement, often through the strong tradition of land economics, was making vast inroads. For many years, most of our departments have been involved at some level in land economics, resource economics, land-use planning, water resource economics, fisheries, or other similar endeavors. Because of such activities, undertaken long before environment and ecology became household words, we are justified in portraying ourselves as forerunners of the burgeoning environmental concern which recently has swept the nation. For many of us, in fact, as far back as the mid-1960s, the phrase "resource economics" had inserted itself into departmental or divisional titles.

Our relatively early environmental concern, through the above variety of endeavors in the natural resource area, is an undisputed claim to strength. But our strength, curiously enough, has often become a weakness. We have sometimes found ourselves in the position of Aristotle's tragic hero, whose superior qualities set him above other men and contributed to his ultimate downfall.

Our glow of pride at being leaders, at being in the environmental business long before it became fashionable, is perhaps justifiable. We have been open-minded and receptive, hailing and welcoming the biologically-oriented ecologists with their popular and "relevant" new courses. But at the same time, especially in the area of instruction, we have stagnated. We have lost ground in relative terms, while others have forged ahead. We often have been complacent, lending approval to the

efforts of other disciplines without rigorously evaluating our own potential for greater contribution in the environmental area. We have continued our competent level of instruction in natural resource economics, and in doing so we have considered ourselves a solid (and perhaps stabilizing) part of the environmental movement.

By playing a rather passive role, then, we have allowed the movement in our universities to become one-sided, to be dominated by enthusiastic biological scientists who are "ecologists" in the true meaning of the word rather than in the mere vernacular. This ecological approach to environmental issues has emphasized the impact of man, his technology, and his economic activities on the balance of nature. In doing so, this approach often has left students committed to the view that environmental quality must be maintained, restored, or enhanced at all costs. Many environmental activists have launched, from such a nature-oriented base, their campaigns for the enactment of public policy measures.

But an environmental movement that progresses not only without quantitative economic input but also without a balanced qualitative view actually has not progressed at all. The informed student must be made aware that virtually every activity, whether culminating in environmental degradation or enhancement, confers both benefits and costs, usually of both a social and a private nature. He must be exposed to the idea, in a sense newly discovered, that pervasive interdependence between the actions of producing and consuming units exists and will continue to exist. Every teaching economist, to be sure, is cognizant of such concepts. But unless he shoulders a leadership role and moves to communicate them to students, his own recognition is sterile.

Given the assumption of continued environmental problems and interest, the potential for instructional contributions from our discipline is immense. These contributions, which can add a certain balance to the environmental knowledge gained by students, can be made effectively at a number of levels of course work.

What Should We Be Doing?

That some of us have lagged in our classroom attention to environmental issues is not, curiously, a totally negative state of affairs. With the cost of being by-passed by more vigorous disciplines has come the benefit of perspective. By failing to jump upon the environmental bandwagon we have, at least, afforded ourselves the opportunity of viewing the environmental movement with a certain reasoned maturity. The time has now arrived, however, to transform that reasoned view into effective and informative classroom performance.

A full-scale curriculum oriented toward environmental matters is unnecessary, perhaps even undesirable. Although an environmental specialist might be useful and employable, there would appear to be a

greater potential for integrating environmental concern into existing disciplines and curricula. An economist, or engineer, or secondary school teacher, or park manager who has added environmental economics to his more conventional training should prove to be not only professionally effective but also a well-rounded and valuable member of society.

Baccalaureate Level Courses

Some of us already are involved in interdisciplinary courses dealing with environmental quality, and more of us should be. These courses, usually of a survey type, provide excellent opportunities for injecting economic perspective into analysis which customarily is rather non-economic in nature; such perspective adds balance to the education of the student who may never take an hour of credit in a conventional economics offering. At the same time, these cross-departmental survey courses are fertile ground for what might be termed academic advertising. Participation, with the resultant student contact, enables us to indicate to students in other fields what we offer as elective course work as well as what our own major programs entail. Exposure of this nature cannot hurt any department which does, in fact, offer instruction of high quality in the natural resources area, including environmental issues as such.

Beyond the survey courses discussed above, at least two levels of baccalaureate instruction in environmental quality appear appropriate for our "agricultural economics" departments. The first is a survey course, without prerequisites, tailored for freshmen and sophomores but perhaps open to upper-classmen. This course provides ample opportunity to teach some rudimentary economic principles within a policy context and to instill awareness of the existence of costs as well as benefits in environmental decisions. This course may, as an offering entitled Agricultural Geography did for me at Cornell, awaken considerable student interest in majoring in our discipline. It is, in addition, a "natural" elective for environmentally interested students in other disciplines as well as for adult education programs. Orientation toward the layman may be enhanced by soliciting the participation of our extension colleagues who are professionally active in areas like planning, zoning, solid waste disposal, and outdoor recreation. Their combination of expertise and focus on public service can lend valuable perspective to such a survey course.

A junior-senior offering in environmental economics can effectively complement a broad survey of issues. For optimum effect, appropriate prerequisites are basic economic principles, intermediate micro- and macroeconomics, and perhaps basic statistics and computer programming. A course at this level can serve effectively as a vehicle for in-depth analysis of environmental issues. Although a variety of specific approaches might exist, the semester could be divided among a half-dozen major issues, for example: open-space planning, transportation alternatives, wilderness areas, air pollution, pesticides, and energy needs.

Each of these, viewed in the dual context of economic theory and public policy concerns, can be analyzed with the aid of some of the economic tools assured by the prerequisites. Case studies of environmental policy problems close at hand can enhance this course by providing real-life examples as well as the opportunity for actual involvement in the policy process. The course can furnish, in combination with a more traditional offering in natural resource (or land) economics, a powerful package for the student who wants to apply his economic knowledge to the problems of managing a society's natural resources.

Graduate Level Courses

Environmental instruction at the graduate level is a question mark, and the potential no doubt differs somewhat between departments which offer only the master's degree and those which confer the doctorate. A great deal depends, also, on the department's objectives and its philosophy with respect to degree of specialization in the graduate program. The amount of environmentally oriented research being carried on in the department, furthermore, can and should be a determinant in the quantity and level of environmental course work offered.

The upper-level (junior and senior) offering described above can, of course, be open to master's students and effectively complement their other courses. Problems always exist when undergraduates and graduate students are combined in a class, but an enforced homogeneity of prerequisites should solve most of these problems. Additional independent investigation, tied in with the basic material, may be appropriately required of the graduate student in such a combined course.

At least one additional course is justified at the graduate level, one delving into advanced techniques and concepts and their specific application to problems of environmental quality and related economic interdependence. The graduate student who can understand and handle benefit-cost analysis, input-output analysis, welfare economics, residuals management, and systems analysis will be well prepared to deal with actual environmental problems once he completes his degree. A graduate course treating topics such as these can effectively serve both the student with a particular environmental interest and the one who has shaped his educational program around more conventional natural resource economics investigation.

It is important to recognize that a relatively advanced level of instruction need not be divorced from reality, and that it does not rule out a strong public policy focus. The old term, "political economy" never has rung more true than in questions of policy toward environmental quality. Departments like our own deal in application, and nowhere is application more important than in analyzing the factual underpinnings of informed public policy.

Other Agricultural Economics Course Work

It would be both inappropriate and impertinent to suggest that our departments, with their strong foundations of commodity-oriented and other agricultural investigation, totally eliminate their agricultural orientation and turn all their efforts to environmental quality. Such a move would result in a waste of resources as well as a distressing lack of recognition of the importance of agriculture to many persons whom we serve.

At the same time, however, no student completing any level of undergraduate program in our departments should be ignorant of environmental considerations. Even the student who emphasizes agribusiness or farming, rather than environmental or resource economics, should be exposed to the rudiments of the costs and benefits inherent in decisions of environmental policy.

At the University of Maine, we have in our department a two-year, associate degree program which we term Resource and Business Management. Because of the applied, near-vocational nature of the program, an environmental course offering as such is not justified. Yet every Resource and Business Management student, no matter what the emphasis of his particular two-year program, receives a strong taste of environmental issues in both his basic economics and political science courses. Exposure of this nature is not only valuable; it is essential.

This environmental exposure idea can be easily extended to baccalaureate level programs. The student concentrating on farm management, or agricultural marketing, or virtually any phase of agribusiness should be made aware of environmental considerations as they relate to his own area of endeavor. With the current level of environmental concern any management course, for example, offered in an agricultural economics department is remiss if it does not at least touch upon the implications of pesticides, nitrates in chemical fertilizers, and waste management. Any course which deals with economic growth and development, with or without a strong agricultural focus, must also instill in the student an awareness of environmental relationships.

Environmental quality should in no way become the focus, the major emphasis, of the courses discussed above. But one of our goals as departments should be the exposure of all our students to the broadest concerns of environmental policy. Integrating such exposure into appropriate existing courses need not compromise our professionalism, and this integration can assure that even our most specialized major has achieved a certain balance in his educational program.

Summary

Environmental interest has blossomed, and the passions accompanying this interest often run high. This concern for environmental quality, in many ways a resurgence of the conservation movement of more than a half-century ago, is likely to continue in the years to come. It will continue as growing population and rapidly expanding technology exert new pressures on a natural resource base which, at least in the sheer physical sense, we must accept as a given quantity.

As professionals, we in departments of agricultural, or resource, economics have been forerunners of the environmental movement. But our relatively early advances under the names of land economics and resource economics have been, in many ways, surpassed by biologically-trained ecologists who, much to their credit, have captivated students and general public alike. We applied economists, while not in any sense oblivious of environmental concerns, often have slipped from the vanguard to the following ranks as the environmental movement has marched forward. This change of relative position has been most pronounced in the area of classroom instruction, for in research and public service we have done a far better job of keeping pace.

Genuine opportunities lie before us when we consider constructive classroom presentation of the economics of environmental quality. These opportunities exist at all levels: interdisciplinary survey offerings, under-class as well as upper-class baccalaureate courses, graduate instruction, and integration of environmental concepts into more conventional agricultural economics courses.

The greatest opportunities lie at the baccalaureate level, for here we can expose students to the social costs and benefits that are at the root of environmental problems, as well to more detailed analysis once the essential economics prerequisites have been met. Whether a major in environmental and natural resource economics, agricultural economics, or some largely unrelated field, every student should be aware of the basic economic concepts which underlie environmental issues.

Our departments already have advanced in research and public service endeavors related to environmental quality. The potential for course offerings to complement these advances is great. An appropriate array of effectively taught courses in environmental quality can round out the instructional programs of our departments in the natural resources area. The right combination of course work in environmental economics can serve the dual purpose of challenging the interested student of today and producing the informed citizen and voter of tomorrow.