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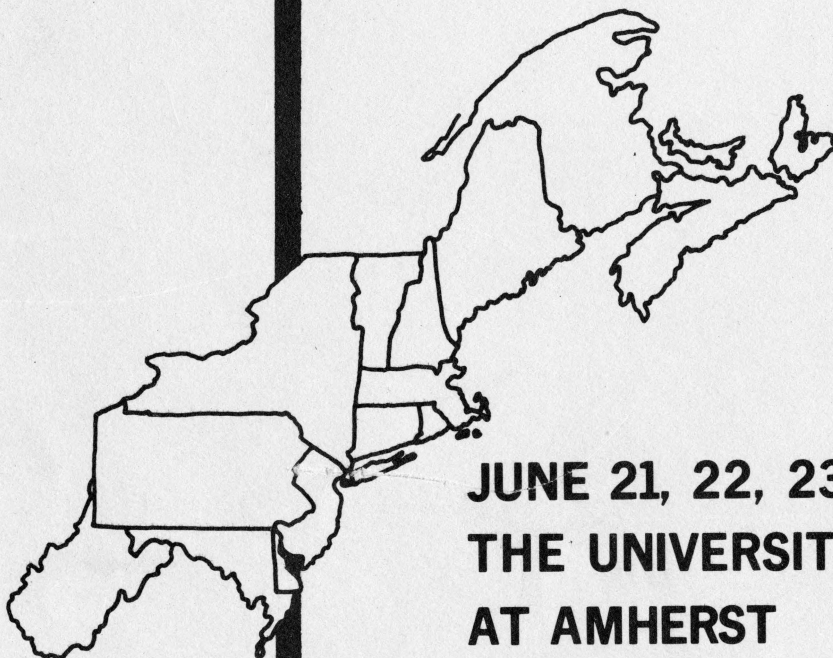
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**THE UNIVERSITY OF MASSACHUSETTS
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WHAT IS OUR PROFESSIONAL ROLE RELATIVE TO ENVIRONMENTAL PROBLEMS?

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Our professional role relative to environmental problems can be simply stated as the responsibility to develop and employ economic measures pertaining to environmental problems which will enable an educated public to properly choose between alternative courses of action on the basis of sound logic rather than on resounding rhetoric alone.

Environmental pollution problems involve two interrelated social issues. One issue pertains to how far society can and should go toward a goal of pristine quality. How much will we pay, including loss of individual freedom, for prevention or reduction of pollution? The other issue concerns how decisions can be made about resource use so that all effects or costs are recognized, measured, and considered.

It appears that the consumer of farm products is changing his mind about what he wants the farmer to do for him.

In the past the mandate to the farmer has been "produce for us cheaply and in abundance adopting quickly and using efficiently every technique that modern science makes available." And the farmer has responded well!

Being close to the American farmer we too were constantly challenged to aid in increasing his efficiency to meet the needs of an ever increasing human population. New and changing methods of production are continually being instituted. The diversified family farm is giving way to large systems of monoculture which contribute to the current environmental problems. Here too we are involved through the dissemination of information relevant to the application of technology in the use of plant nutrients, pest control techniques, conservation practices, and livestock and poultry production systems. But in our zeal for increasing agricultural efficiency, we fail at times to evaluate the total environmental implications of these actions. Wastes from large animal feedlots may pollute streams, cause fish kills, and foul the air with offensive odors and dust. Comparable problems arise from tillage and irrigation practices as well as from the use of plant nutrients and pesticides. Virtually all of these practices have in some way been challenged through legal action for creating pollution or environmental degradation.

In fact, it was public concern that helped bring into being the Environmental Policy Act, or Public Law 91-190. The Act provides organization and procedures that will assure full consideration of both direct and indirect impact of Federal and federally-supported programs. This Act in turn was followed by Public Law 91-224 which established the Office of Environmental Quality. Next, Reorganization Plan No. 3 established an Environmental Protection Agency (EPA) with the assigned responsibility for protecting the environment against pollution; a concurrent Plan No. 4 established the National Oceanic and Atmospheric Administration (NOAA) with responsibility for oceanic and atmospheric environmental aspects, including commercial fisheries.

The Congress on October 13, 1970, passed H.R. 18260, or the Environmental Education Act, which authorizes the Secretary of Health, Education, and Welfare to establish educational programs to encourage understanding and support of activities designed to preserve and enhance environmental quality and maintain ecological balance. The intent of this legislation is to assure the inclusion of ecological information at all educational levels, including Extension. These actions reflect both public and Congressional concern over the quality of the environment and the seriousness of the intent to protect, preserve, and improve that quality.

We as economists have the opportunity and the challenge to assist in the development and application of the technology required to give us clean air, clean water, a stable and verdant land abounding with wildlife, as well as the required abundance of food, fiber, and forest products. We have, in fact, a blueprint for action program; a blueprint that specifies that a satisfactory environment is more than mere freedom from pollution. It is one that must afford opportunity for people--the opportunity for development, the opportunity to satisfy their needs and desires, and the opportunity to attain the amenities which technology affords.

Within the framework of this blueprint we have the opportunity working with the diverse professional staff of our respective organizations to develop programs which will contribute positively to improving environmental quality. But we can not develop these programs alone.

Research at the Federal laboratories and State Experiment Station provide much of the information on which such programming is based. Further, the Agricultural Stabilization and Conservation Service (ASCS), Consumer and Marketing Service (C&MS), Farmers Cooperative Service (FCS), Farmers Home Administration (FHA), Forest Service (FS), Rural Electrification Administration (REA), and Soil Conservation Service (SCS) are available to assist in the application of technology for comprehensive and effective programs. In addition, we

must not overlook the expertise and assistance available from non-agricultural agencies, particularly those with assigned legal responsibilities.

Future Emphasis Must be on Understanding

Resolution of the current emotionalism associated with environmental quality will depend on intelligent and sober appraisals of the actions needed to prevent further environmental deterioration. Basic to this issue is the intelligent use of all components of the environment and the need for ecological considerations in decision making. Each citizen of this nation must be made to appreciate his personal responsibility to the physical environment--air, land, and water. He must understand how the use and management of these relate to environmental degradation or environmental improvement, or both.

You as Agricultural Economists have had an important part in the drafting of the plans for today's agriculture. Changes in land use and improvements in agricultural production and processing were made with conscious attention to environmental manipulations to meet the needs of a steadily increasing population. Throughout the agricultural evolution and revolution, efficiency was the motivating force--grow two blades of grass where only one grew before and do so at a profit to the farmer. However, all too frequently programs were designed and actions recommended without adequate knowledge or consideration of long-term ecological consequences.

In both production and processing, agriculture generates and is subject to losses caused by pollutants. We have not always recognized this fact in the past. There was the time when Extension publications carried recommendations to locate animal feedlots on slopes adjacent to streams. The justification was predicated on maximizing animal comfort; the lots would remain dry and in turn minimize foot problems and stress induced diseases. The role of the stream was that of a sewer rather than a significant environmental resource.

Comparable situations evolved with changes in cropping and harvesting practices. Whereas straw, stover, and other harvesting by-products were also harvested and recycled, advances in equipment design made it possible to harvest the crop while leaving the residue on site as waste. Again in the interest of economics, it was more convenient to dispose of these wastes into the atmosphere by burning. Now, faced with regulatory directives prohibiting the use of air and water as sinks, we are faced with new and serious challenges.

As concerned economists, we must look beyond the farmer and his farm. We must see agriculture as an integral part of the total human environment. In evaluating the human quality of the environment, it is imperative to keep in mind

that passive exposure to stimuli, such as this discussion, is not in itself adequate to elicit individual development. The stimulus is formative only if the individual responds to it actively and creatively. I challenge you to do this.

Man, because of his unique adaptability has been highly successful as a biological species. As Rene Dubos points out [2]: "He can hunt or farm, be a meat-eater or a vegetarian, live in the mountains or by the seashore, be a loner or a team member, function under aristocratic, democratic, or totalitarian institutions, but history shows also that societies that were once efficient, because highly specialized, rapidly collapsed when conditions changed. A highly specialized society, like a narrow specialist is rarely adaptable."

Within the context of this philosophy, it would be well to look at our image. Have we as individuals played the role of the narrow specialists, viewing the areas of our activity as a steady state because of our unwillingness to consider ecological and environmental implications? The ecologists have repeatedly pointed out that the physical forces of the environment are constantly changing while the continuously evolving life forms are individually and collectively contributing to environmental change. Since there can be no steady state or status quo, we must ask ourselves if our future contributions will be predicated on blind acceptance or deliberate rational judgment.

Environmental Education and Planning Depends Upon Problem Identification and Coordination

Secretary Hardin, speaking on People and the Environment [1], stated: "Our task as a Nation is, on the one hand, to utilize knowledge and technology to meet the increasing needs of all society; and, on the other, not only to avoid despoilment and conserve resources but also to improve upon the space and esthetic dimensions of the environment."

As Agricultural Economists, be we Extension, research, or industrial workers, our mission is integral to assisting agriculture and society-at-large with that task. However, for all too long, environmental planning has been predicated on cultural, social, and landscape-creating parameters. Essential steps in planning, concepts and theory, establishing goals, fact gathering, design and planning are simple to enumerate but complex to execute. Until clear representations and models of man and his environment--the problems and causal relationships--are made a part of the common knowledge of each individual, community and region, little progress can be made. Society has not had this kind of integrated knowledge in the past. City, urban, industrial, regional, and agricultural planning of the last 30 or more years has been in response to presumed socio-economic needs. Meeting future needs demands revision of some of our current

modes of thinking. This will require participation from a wide variety of disciplines, in addition to economics we will need engineers, horticulturists, foresters, health professions and biologists, sociologists, lawyers, regional planners and public administrators to achieve the necessary changes.

The spread of urban settlement, community development patterns, labor supply and market areas influences regional development. The needs for land, water, waste disposal, flood control, water conservation, forests, parks, and space for recreation influence man's dependency on nature. Farming, in fact all agriculture, is influenced by metropolitan and suburban needs and desires. On the other hand, urban desires and plans without rationalization can drastically affect land use, value, and food production efficiency for general or special farm use. Inextricably related are drainage plans, waste disposal regulations, industrial pollutants, and highway patterns and plans.

Abstract or special interests can and do influence understanding and use of the environment. Solutions to environmental problems cannot be solved through fragmentation by mercenary specialized interests or disciplines. Too few in our society are aware of or knowledgeable about environmental interdependence. Solutions will depend upon special interest groups being willing to equate their knowledge cooperatively with others for the benefit of all.

The need for increased emphasis on environmental education was alluded to by Secretary Hardin at the 1971 Meeting of the Land-Grant Colleges. He reported that action had been initiated for the development of a Department-wide environmental education program. Plans for such a program call for the Extension Service to provide training and information to the land-grant colleges and universities, experiment stations, farm organizations, industry groups, leaders of natural resource groups, and the general public.

The Study Group, in its consideration of agriculturally related environmental problems, identified the following needs which could be met by an effective training program:

1. An understanding of basic ecology, man's individual and collective relationship to ecosystems and the impact of this interaction on the Department's missions and goals.
2. Create an awareness and understanding of the benefits derived from interagency coordination of activities affecting environmental quality.
3. Educate employees in Federal laws and regulations, the Departmental policies and procedures related to environmental quality.

4. Effectively communicate the benefits of the Department's programs for maintaining and improving environmental quality.
5. Identify agriculturally-related pollutants and practices affecting environmental quality as generated by non-agricultural practices that damage agriculture, and the ecological consequences of these pollutants and practices.
6. Establish realistic criteria, standards, and tolerances for agriculturally-related pollutants and practices; identify areas of cooperation between the Department of Agriculture, other Federal and State agencies, land-grant colleges and universities, and industry.
7. Establish an effective monitoring and control system for agriculturally-related pollutants.
8. Provide program orientation in modern decision making tools and techniques.
9. Identify the impact of political, economic, and social factors on environmental quality decisions and the ecological consequences of these decisions.

Within the framework of these teaching needs, the areas of significant concern encompass the following broad subject areas:

1. Resource Management and Environmental Enhancement
2. Waste Management and Recycling
3. Agricultural Chemical Use, Control, and Alternatives
4. Housing
5. Timber Production and Environment

For further clarification, let us examine item 3, Agricultural Chemicals. To be more specific let us examine pesticides, their nature and future plans for their use. All pesticides are toxic; they must be to be effective. Further, their toxicity extends frequently beyond the target species. The extent of this detrimental effect is related to the manner of use, which oftentimes has not been judicious. There is a more intelligent way to control pests than the wanton use and indiscriminate application of pesticides. It is referred to as insect management,

where a comprehensive understanding of pests and their predators makes it possible to manipulate populations and hold insect pests to an economic level so that limited amounts or no pesticides are needed. This concept, artfully applied, offers one of the most rewarding undertakings for future environmental enhancement. Equally challenging and rewarding will be the development of the expertise that will enable us to resolve or minimize other problems and concurrently improve the quality of the physical and human environment.

In summary, President Nixon, in his 1970 Message to the Congress on the State of the Nation's Environment, provided all of us with an environmental blueprint for future action when he said:

"...our challenge is to find ways to promote the amenities of life in the midst of urban development...along with the essentials of jobs and housing we must also provide open spaces and outdoor recreation opportunities, maintain acceptable levels of air and water quality, reduce noise and litter..."

"By the same token, it is essential that we make rural life itself more attractive, thus encouraging orderly growth in rural areas..."

"Throughout the Nation there is a critical need for more effective land use planning and for better controls over the use of the land and the living systems that depend on it.

"We must move increasingly toward closed systems that recycle what are now considered wastes back into useful productive purposes..."

You gentlemen are an integral part of agriculture and have a long history of concern for environmental quality. Yet there is still the opportunity to challenge our motives. Are they based on the sole purpose of exploiting the environment to serve man, or predicated on a creative art to work in consort with the environment for the benefit of man? Let me ask, how high on your list of priorities do you place work relative to environmental problems?

Action to meet current alarms is critically important. In agriculture itself we know that there are actions we can and must take to correct the practices that degrade our environment; actions we can take to develop an intelligent land-use policy; actions we can take to enhance rural living and at the same time ease some of the pressures in our congested cities.

Furthermore, this is no time for yielding to fear of new knowledge or of more effectively using and understanding what we already know. This is not the

time to consider retrenchment of research, teaching or Extension particularly that dealing with basic natural and social phenomena. To the contrary, the problems we are having today with applications of knowledge are stark testimony of the need to learn far more and to put it into action in your discipline and in your community.

References

1. People and Environment, 1971 Pear Annual, 701 Campbell Avenue, Santa Clara, California.
2. The Biosphere, UNESCO COURIER, January 1969.