The Land Use and Conservation Program at Harvard

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THE PROGRAM of training and research at Harvard University in the development and use of renewable natural resources is an outgrowth of about two decades of experience. Under the control of the University's Graduate School of Public Administration, it has thus far been designed primarily to serve students who come from the public services.

Any program of this nature needs to test new concepts and assumptions. It must deal with materials derived from various disciplines, and must therefore find ways of breaking through the departmental boundaries that are now so much a part of academic life. Further, it must find personnel within these disciplines whose interests and aptitudes will enable them to take an active part in a field of inquiry containing much that is outside their ordinary fields of activity. Another fundamental requirement of such a program is that of maintaining rigor in a synthesis of materials and ideas from these various disciplines with their different theoretical systems and techniques of analysis. To design a consistent conceptual framework that is relevant to the issues of resource use and development from these diverse sources requires a carefully thought out philosophy of method.

The Purpose of the Program

The efficient use and development of renewable natural resources has become increasingly important over the years. This efficiency depends on successful integration of information from two broad fields. The physical and biological possibilities embodied in a resource are defined by knowledge of its characteristics that is derived from the natural sciences. A constant flow of materials and ideas is needed from research in such fields as biology, soils, geology, and engineering if management decisions are to have a foundation in reality. Assessment of these possibilities in terms of economic and social values is essential before management decisions can be made in actual situations. In turn, research in the areas of economics, government, law, history and business provides equally important sources of ideas essential to satisfactory assessment of the physical and biological possibilities of resource use and development.

The past relationship of man to the resources of land, water and forests shows many dislocations. Whether these dislocations are concerned with publicly or privately controlled natural resources, and whether they involve shortages or surpluses, they need for their solution some method by which existing knowledge from both the natural and social sciences can be brought to bear at points of effective action. Correlative thinking is by nature extremely complex, and involves the problem of multiple interacting variables. The best that can be hoped for are partial solutions based on developing an analytical framework that will enable us to recognize and interpret coincidences among relevant patterns of fact.

The principal need is for men who can think correlatively with materials and ideas from many phases of the natural and social sciences—men whose training goes beyond specialization. The present program attempts to provide the basis for a synthesis of the relevant data from the natural sciences with the analytical methods of the social sciences. The program avoids specialization in its training and research. It aims not at complete solutions of resource problems, but rather at statements of these problems in a form that will make partial solutions possible, considering the developing state of our knowledge.

The Role of Research

A necessary characteristic of the program is that it contains research focused upon actual problems in the field of renewable resources—problems that are being studied currently. The unifying principle is not in the formal organization of subject matter in terms of departments and courses, but rather in direct attacks upon research problems which serve to integrate ideas and materials derived from many sources. It is essential that if the program is to be effective it must be founded upon such an attitude of inquiry into the fundamentals of management and use of the resources. Further, it is necessary that such research inquiry should have continuity and stability, and that it be closely integrated with the training program.

To meet these requirements, the research utilized is in the general fields of both the natural and social sciences. In the first, the objective is to assess the elements of productivity of natural resources. At the same time

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repeated investigations are made of the natural limitations upon proposed resource use. A major objective of research in the social sciences is to evaluate the data of productivity and to find methods of directing investment in resources so that the returns will be satisfactory to both private and public owners. A parallel objective is to design and test institutional structures that will support such investment and at the same time be consistent with the political and social objectives of society. Materials for this research are on every hand, and are being exploited currently by the Seminar. Papers written by former students are being used as the groundwork for continuing exploration. Connections with these earlier students bring to the Seminar information on new problems, thus providing lines of communication between research at Harvard and its application in the field. Concentrations of former students in various parts of the United States can also provide subsidiary centers for the study of problems outside New England.

One specific field of research that has emerged from this general pattern is the study of the concept of the planning unit. The planning unit is defined as an *ad hoc* organization of operating units formed by their concern with common problems and with the objective of making possible the more efficient development of the natural resources within a designated area. Here the range of issues and objectives includes and goes beyond those considered in operating unit analysis. Three examples of this research are: (1) An investigation of three watersheds, the Ash Swamp, the Walloomsac and Johnson Creek. The problems analyzed have included flood control, the development of water resources, and stream pollution; (2) An analysis of a forest area in Grafton County, New Hampshire; and (3) The development of a model law for creating an effective state Department of Conservation in Massachusetts.

The Curriculum

A fundamental purpose in the design of the curriculum is to make available for training and research the facilities of the various schools in the University. Thus there is flexibility with regard to course programs, so that both faculty and students have free time for individual research. Likewise, provisions are made for alternative courses to serve particular student needs. Most of the previous academic training of the students has been in the natural sciences. Because their work at Harvard is in large measure based on material from the fields of government and economics, it often is difficult for them to apply their earlier training. Bridging this gap is an important function of the curriculum.

Throughout the history of the program at Harvard, the Harvard Forest, which is located in Petersham, Massachusetts, about 65 miles from Cambridge, has played an important part. Particularly during the past six years the staff of the Forest has played an increasingly significant role in the program, and the Harvard Forest itself has been used as a demonstration area for problems in renewable resouces. This forest has been under active and continuous experimental management for about 50 years, and has a large amount of readily accessible data on the behavior of the forest resource under management. Its current staff is actively engaged in research in both the biology and economics of the production of wood on the land. Through the program's close relationship with the work of the Harvard Forest, it has acquired materials and ideas that have been extremely useful to the students in seminar work, and the Forest has served as a part of the needed bridge between the earlier training of the students and the heavy emphasis upon the social sciences that is now a part of the program.

Currently, the Graduate School of Public Administration awards from eight to ten fellowships a year to members of the Seminar on Land Use and Conservation. The students are asked to arrive at the Harvard Forest about two weeks prior to autumn registration in the University. These two weeks are devoted entirely to field studies which are designed to give the students a view of the natural resource base in New England and to establish by example the analytical methods used in the Seminar. A few days are spent at the Forest, which provides specific cases in resource management. Then there is a series of trips by automobile to points of interest in the New England states, to illustrate how the concepts used in the Seminar can be applied in the landscape.

The students register in the Graduate School of Public Administration late in September as candidates for the degree of Master of Public Administration. During the two following semesters they are required to take the equivalent of four full courses, one of which is the Seminar on Land Use and Conservation.

The Selection of Students

Students accepted for participation in the program are chosen from among those who have demonstrated their capacity to develop in the resource management field. They are selected also for their promise as contributors to the research work in progress. Those responsible for the program prefer to find these students through the agencies that employ them. The various government agencies concerned with resource management are asked to select promising men from among their personnel and have them present applications for admission to the program. From these applications, already processed by the agencies, the University makes its selection.

By this method of choice, the Fellows who are selected come with the knowledge that their nomination has been supported by their employing agency. From the point of

view of the program, screening by the employing agencies usually means a more effective scrutiny of the candidates than would be possible from direct application to the Graduate School of Public Administration. Not the least of the advantages of this close contact with the state and federal land-use agencies is that it provides a line of communication between the agencies and the program which is useful in keeping the latter up to date on the critical issues in resource-use policy and the direction of new development.

Plans for the Development of the Program

It is expected that in the next few years the general content of the program will be continued. Plans for changes in the timing and location of the work in certain parts of it are now being considered. In addition, it is expected that students from resource management institutions other than the public services will also be eligible for fellowships.

At present the period of student residence is approximately nine months. Under the new plan this would be extended to eleven months, and the students would be asked to come early in July to the Harvard Forest. During the summer the content of the present Seminar on Land Use and Conservation would be given, together with one other course. At the Forest there would be greater facility for field work in the problems with which the Seminar deals. In late September the students would register in Cambridge for four half-courses in the Graduate School of Public Administration, to be completed in the Fall Term. Beginning in February they would be expected to undertake individual research, and to present theses by the end of the Spring Term toward the end of May. Work on this research could be done at the Forest or in Cambridge, or both. In addition, they would be required to take two seminar courses in Cambridge, both of which would come on the same day of the week so that if the students were at the Forest they could easily take them by commuting. Students who wished to pursue graduate work in business administration rather than in public administration would be able to go in September from the Forest to the Graduate School of Business Administration, or those who wished to take a master's degree in Forest Science could stay on at the Forest.

The proposed new program would make it possible to combine the training and research aspects of the program more effectively. It is designed to enhance what has always been the objective of the Land Use and Conservation Seminar—to develop the skills and add to the fund of knowledge that will contribute to a more productive use of renewable natural resources.

Figure 1. The Seminar group has its first meetings in field trips prior to autumn registration. The Harvard Forest in northcentral Massachusetts furnishes an excellent starting place.

Figure 2. On the rock-bound coast of Maine at Mt. Desert Island many land and related marine resource uses, including recreation, are examined.

Figure 3. At a dairy farm in the Champlain Valley of northern Vermont, the seminar group begins some analyses of agricultural economics and land use.