

a natural resource program: its benefits and shortcomings

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A vital part of an overall environmental Extension program is the continual education of community officials who make land use decisions.¹ This article describes a program, designed to fill this need, that was conducted in Connecticut over a three-year period and then critically evaluated.²

Educational Need

As in most states, planning and zoning boards in the 169 town and city governments of Connecticut control the use of private lands. Their land and water use decisions, like the location and design of subdivisions, shopping centers, sanitary landfill sites, or green belts, are usually based on economic, social, and political guidelines. The adequacy of the natural resources to support the proposed use should be a key factor in these decisions. But this is seldom considered because most resource information isn't readily available or understood by part-time local government officials.

A number of states have started using natural resource inventories to effect more intelligent land and water use decisions. These inventories compile soils, hydrology, and use information. However, they generally lack the ability to integrate this information in a practical way. Also, only a few, such as New York's Land Use-Natural Resource System, are statewide.

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Interpretative data systems aren't as advanced. In most cases, the available data were collected by a number of different agencies for purposes other than interdisciplinary planning. Therefore, the basic data from agencies like the U.S. Soil Conservation Service (SCS), the U.S. Forest Service, the U.S. Geological Survey, and the National Weather Service aren't in a form that's readily usable by nondiscipline-oriented people. Nor is the information easily interchangeable with other basic resource information.

Natural Resource Interpretation

An educational program that gives community officials the skills and knowledge necessary to make land use decisions requires information about the distribution of natural resources in their communities.

Connecticut has a program in progress that draws information from many disciplines and agencies concerned with natural resources for use in a truly interdisciplinary, interpretative system. The system organizes resource information in a common map format. It's easily used by local officials who don't have formal training on interpretation of basic resource information.

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The system was developed by the Natural Resource Center of the Connecticut Department of Environmental Protection (DEP) and is described in detail by Thomas.³

The Connecticut Natural Resource Interpretative System, where the inventory data are integrated, can be used for any area—from those with extensive natural resource inventories to those where little detailed information is available. In the latter case, the system can most effectively use what is known and can incorporate new information as it becomes available.

Outreach Workshops

The Connecticut Cooperative Extension Service (CCES), DEP, and SCS cooperated to assemble a series of four, two and one-half hour workshops to train local government officials in Connecticut to use the Natural Resource Interpretative System in local decision making.

A pilot program was conducted in the spring of 1972. Then in a 3-year period, a series of 4 workshops was conducted

for planning and zoning and conservation commission member in 140 Connecticut towns.

The workshops were usually conducted in a place easily accessible to the participants, often at the county Extension centers. Participants from each municipality worked together with materials and data covering their local areas. A basic text and reference manual containing explanations of all the materials were provided.⁴

The first workshop featured a session on the summarization of the natural resource data available to the individual town. The basic sources of natural resource data, topography, bedrock and surficial geology, hydrology, soils, and land use were described and problems in integrating data discussed.

The next two sessions consisted of working on interpreting data together with basic education on their meaning and use.

From basic resource maps and accompanying data, single factor maps were developed to show areas having common characteristics. These included steep slopes, bedrock at shallow depths, high water tables, flooding, availability of ground-water supply, and land use.

The information developed was put on transparencies to show several characteristics. Participants were taught how to make or obtain the 23 single-factor maps listed below.

Orthophoto	Drainage areas
Topography	Floodprone
Landforms	Depth to water table
Slope	Availability of ground water
Bedrock type and structure	Wetlands-tidal and inland
Depth to bedrock	Streambelt
Unconsolidated materials	Channel encroachment and floodplain delineation
Aggregate survey	Major open spaces
Natural soil groups	Existing sanitary and water-related facilities
Soils saturated within 3' of surface 2-12 months	Existing and potential water supply watersheds
Soils saturated within 3' of surface less than 2 months	Vistas and views
Percolation rate classes of soils	

At the last session, the participants worked on exercises using the materials to identify areas in their town with favorable or unfavorable characteristics for uses like sanitary landfills, on-site disposal of septic tank effluent, or transportation and public utility corridors.

Personnel Involved

Enlisting the active participation of as many different state and local agencies as possible makes this effort much

more effective. It shows the municipal decision makers the expertise and types of aid available to them on a local basis. Also, it improves cooperation between local offices and agencies in natural resource and land use planning efforts.

The Extension community resource development agent in the county involved coordinated the workshops, disseminated publicity, aided in the instruction, and led discussions on various aspects of the workshops. Personnel of the DEP's Natural Resource Center developed most of the map materials and technical information used in the workshops. Other personnel from the local soil conservation district and regional planning agencies also took part. All of the sessions were team-taught, with two discussion leaders.

Program Costs

Personnel time was the largest single expense involved. More than 2,500 hours were spent by professionals and 1,400 hours by subprofessionals on the preparation and delivery of the education program. Also, \$1,350 for travel and \$1,600 for handout materials were used over the 3-year period. The cost of materials was offset by a nominal charge of \$7.00 for each participant.

Program Effectiveness

Evaluation

The outlay of personnel time and effort was justified by the success of the pilot program and the continuing response of the participants. But, an independent evaluation of the program was needed to gain some perspective on future program directions.

How had the program been successful and how had it failed? What value was the program in terms of the basic education of the participants? Were the materials and concepts of the workshops being used by the towns that attended? Did the program provide a basis for widening the participants' knowledge with future "in-depth" follow-up programs? To find answers to these questions, a complete evaluation study was initiated in July, 1975—3 years after the program began.

Three different methods were used to determine the effectiveness of the workshops: (1) one-third of the workshop participants were interviewed by phone, (2) all the professionals involved were mailed questionnaires, and (3) 28 towns (19 of which were represented at the workshops) were investigated by reviewing the town records and personally interviewing town employees. The town reviews estimated the level of natural resource information used in each town before and after the workshops were held. Agreement between the

three sources was used to validate the conclusions drawn from the evaluation study.

Results

Here are the general results of this study:

1. Education of Decision Makers

a. Positive results

- A greatly increased awareness of the existence of natural resource information was gained by board and commission members.
- An increased awareness of the possible uses of natural resource data in their decision-making processes was gained by board and commission members.
- Those who were currently involved in a specific project or application gained the most knowledge.
- The ability of the board members to understand problems and communicate with and control their in-house professional staffs was increased.
- Members of boards and commissions who attended the education program shared what they'd learned with other members of their decision-making body.

b. Negative results

- Specific skills to use the natural resource information to determine site-carrying capacity weren't understood by the "lay" board members.
- Those who were already professionals in some area of land use (that is, town planners, engineers, etc.) learned the least in the program.

2. Effect on land use decisions in the communities

- Natural resource information isn't used extensively right after the education program, but its use increases after several years.
- Natural resource information is used extensively in decisions when an in-house staff of professionals are available to do the detailed work.
- The town boards or commissions with environmental protection mandates used the information learned most extensively.

Awareness

The evaluation definitely showed the workshops increased general awareness of the existence of natural resource information available to the towns and an awareness of its possible use in the land use decision-making process. However, the process of using resource information wasn't sufficiently explained to enable the participants to put natural resource information to practical use on a regular basis.

The workshop audience, for the most part, was "lay" land use commissioners who saw an opportunity to get training from professionals in land use related fields. Those who gained the most from attending the workshops were individuals who came to the workshop with a high level of personal motivation or with specific goals in mind, like someone revising a town plan.

The 10% of the participants already familiar with many of the workshop materials and concepts gained the least from the program. But their presence at the workshops indicated their desire for additional education in the land use area.

Time Lag

To date, the workshop materials and concepts have been used some in the towns, but not extensively. A definite correlation exists between the frequency of use of the information and the length of time since the workshops were attended. It apparently takes some time for towns to digest new information before it can be applied or instituted into the decision-making process.

Many of those who attended felt their town was slowly incorporating ideas expressed in the workshops into the decision-making process. In some towns, the goal of incorporating resource information into the land use decision-making process has been set, but won't start until an in-house or outside professional is hired.

Maximum use of the information is made by conservation commissions, inland wetlands commissions, and in-house professional staffs.

Towns that were initiating or undergoing land use related projects, like updating master plans or zoning and subdivision regulations, used the information most extensively.

Technical help is needed by most of the towns to incorporate the materials and concepts of the workshops. Towns without in-house staff often depend heavily on the Soil Conservation Service.

Program Continuation

Despite some weaknesses in flexibility, organization, and promotion, the workshop outreach approach used was an effective way (probably the only way on a statewide basis) to educate local land use decision makers on the basic technical aspects of their responsibilities. But it wasn't enough to teach them professional capabilities. The evaluation demonstrated that the program created an enthusiastic audience that wants, and can use, new "in-depth" programs.

The evaluation showed that about one-third of the membership of municipal decision-making bodies changes annually. And the continuance of the present basic program for these new inexperienced members is important.

This presents a dilemma. How can the limited personnel available continue the "basic" program and still go on to a more sophisticated follow-up program that's necessary to ensure long-term, sound, land use decisions?

The evaluation pointed out two additional facts that might be used to overcome this problem. It showed that a "multiplier effect" was in progress, where about 80% of the program participants share with others some of what they'd learned. Also, the towns' in-house professionals and commissioners with scientific backgrounds were already, or became, well-versed in the workshop concepts.

Footnotes

1. D. R. Miller, "Developing Environmental Programs," *Journal of Extension*, XV (March/April, 1977), 20-26.
2. M. E. Frye and D. R. Miller, *Evaluation of the Connecticut Cooperative Extension Service Natural Resources Education for Community Land-Use Decision Makers* (Storrs: University of Connecticut, Cooperative Extension Service, 1977).
3. H. F. Thomas, *The Natural Resources Center* (Hartford, Connecticut: Department of Environmental Protection, 1977).
4. H. F. Thomas, D. R. Miller, and R. C. Hyde, *Manual for Workshops on the Use of Natural Resource Data by Land Use Decision Makers*, 2nd ed. (Storrs: University of Connecticut, Cooperative Extension Service, 1977).