THE BALATON BULLETIN

A bimonthly newsletter

of The Balaton Group

OCTOBER, 1982

INTRODUCTION TO THE BULLETIN

In September 1982 thirty scientists and managers met in Hungary to review the state of the art of natural resource modeling and to identify ways we could advance the theory and the practice of regional resource management. Those attending the meeting wanted to identify ways of supporting each other in the design and implementation of policies that:

- greatly raise the productivity of each region's natural resource endowment and
- maintain or increase its overall fertility.

We represented more than ten research institutes and four international scientific groups: The United Nations University, UNESCO, the International Institute of Applied Systems Analysis, and the International Federation of Institutes for Advance Study. The meeting was sponsored by UNESCO and by the Hungarian Ministry of Industry. A list of the principal participants is attached to this newsletter.

During the symposium the group developed a basic study agenda that could guide our individual efforts and shape our collaboration for 3 to 5 years of research. We agreed to create an informal association. The Balaton Group, which takes its name from the lake that provided a beautiful backdrop to the conference deliberations.

This is the first issue of the bimonthly bulletin created to facilitate our cooperative program. It summarizes our agreements at the founding meeting, and it lists the joint and the individual projects the members of the Balaton Group expressed interest in carrying out over the coming year. This report is not intended to summarize fully the Lake Balaton discussions. Nor does it give a complete exposition of our research plans. Instead it records important parts of our meeting and reminds the Balaton Group members of the next steps we have agreed upon.

This issue of the Balaton Bulletin was prepared by Dennis and Dana Meadows at Dartmouth College. It will be sent to all members of the Balaton Group and to a few other individuals who are deeply interested in this international network of resource scientists. Future issues of the Bulletin will consist of entries by all members of the Group, and only periodic contributors will continue to receive the publication. Further information on subscriptions and contributions is provided on page 14.

PURPOSE OF THE BALATON GROUP

Effective collaboration within any group requires that its members share a clear definition of their goals. There is an unstated but clearly shared set of common interests or methods or questions that does define our group and that led each person to come to the meeting in the first place. For our own internal purposes, we probably do not need to make our shared purposes explicit. But discussions with others, providing them with enough information to decide that they might properly align with us, do require a concise description of what we're about. Here is our first attempt, originally drafted by Jorgen Panders and Ferenc Rabar, and subsequently edited by the group as a whole. Now that we have time for considered reflection, further comments are welcome.

We were inspired by a statement written by Jane King that expresses the general viewpoint we all share:

It is the responsibility of governments to ensure that short-term planning is consistent with longer-term interests and the possibility of securing a future, which is sustainable and can provide reasonable standards of living to all.

Any nation has at a given time a range of potential futures, some acceptable, others not, depending on the combination of its resource endowments, demographic circumstances, the skills and socio-cultural attributes of its population, available technologies, and trading opportunities with the outside world. The problem is to find a means of defining that future which is in the best interests of a society; and in this the concept of carrying capacity can provide a helpful point of departure.

Carrying capacity expresses the level of population, which can be supported by a country at a given level of welfare. More precisely, it may be defined as the number of persons sharing a given territory who can, for the foreseeable future, sustain a given physical standard of living, utilizing energy and other resources (including land, water, air, and minerals) as well as enterprise, skills, and organization. This interpretation is far from the rigid notion of a static population/food relationship.... Carrying capacity as understood here is rather a dynamic concept, which may be extended (or restricted) in numerous ways; through changes in cultural values, technological discoveries, improvements in agricultural husbandry or land tenure systems, changes in education systems, modifications of fiscal and legal arrangements, discoveries of new mineral sources or the emergence of a new political will. There is never only one solution to the population/natural resource equation, for it is not population alone which determines the pressure on resources...but also individual consumption, which in turn is determined by value systems and perceptions of life style. Whatever a country's situation, potential has to be matched with constraints and the most satisfactory possible outcome, or outcomes, selected. If carrying capacity can be clarified, it can offer a useful means of helping politicians shape the future of their societies.

THE PURPOSE OF THE BALATON GROUP is to seek and communicate better understanding of the changing pattern of resource utilization and its relation to the quality of life in the long term, in order to improve resource use based on the concept of sustainability.

The first part of the statement reflects our two main activities - research and education, our common area of interest - resource utilization, and our two main goals - raising the quality of human life and sustaining the long-term fertility of the resource base. The second part makes the point that we want understanding not only for its own sake, but also, and for some of us primarily, to affect actual resource use constructively and positively.

This purpose statement is provisional and subject to further refinement.

GUIDING QUESTIONS

Any scientific field can be defined by its "warranted queries" - the questions that are sanctioned for investigation by the field's practitioners and that are accessible to its methods. The Balaton meeting identified seven general questions that will serve as the framework for our efforts. They will also be used to structure the agenda for the 1983 meeting. Papers presented at the 1983 Balaton session must contribute toward the answer of one or more of them.

1. What is the current maximum sustainable use of the resource base:
   nationally, regionally, globally?
   for one resource, for several, for all?

2. How could the sustainable output be increased:
   through better management?
   through changed technology?
   through new trade patterns?

3. What is the cost of exceeding the sustainable level:
   in the short term and the long term?
   in monetary terms? in resource terms?
   in employment terms? in dependency?
   in beauty?

   What is the cost of not exceeding the sustainable level?

4. What are ways of facilitating the transition to more extensive reliance on renewable resources:
   by reorganization?
   by technological advance?
   by trade?
   by research?

5. What are the likely future consequences of unequal distribution of the world's resources:

   inside countries?
   between countries?
   globally?

6. How may the carrying capacity be affected by social and economic development in the form of:

   economic reorganization?
   population growth?
   cultural change?
   technological change?

7. How can our understanding of the answers to any of these questions be most effectively communicated to other scientists and to decision makers?

These specific questions are all elaborations on a concern that many of us brought into the meeting:

For any region or nation, or for the entire globe, how can the entire spectrum of human needs be met from the total resource base:

sufficiently,
sustainably,
reliably,
equitably,
appropriately, and
beautifully?

INDIVIDUAL PROJECTS

Members of the Balaton Group identified several relevant projects that they were working on, or would like to work on, over the next year:

Tom Adler (Resource Policy Center, Dartmouth College, USA):

1. Articulate a central model structure for a comprehensive management game on policies that yield sustained high output from the total resource base.
2. Develop the conceptual approach for several individual model sectors.
3. Implement a prototype teaching model on the microcomputer chosen for the Balaton Group network.
4. Develop supporting materials that would be useful in core courses on resource policy at the master's level, such as courses taught at the RPC.

Hartmut Bossel (Institute for Environmental Systems Analyses,

Gesamthoch-

schule, Kassel, FRG):

1. Create a general model of a sustainable energy system for a medium-size city and apply it to the city of Kassel.
2. Model agricultural production, on a farm level, in both the present industrial and organic technologies, comparing energy use, capital, soil quality, economics, yield, etc.
3. Develop a teaching model to show feasibility and dynamics of an alternative economic structure (based on renewable resources, recycling, long-life products, fair division of labour, etc.)
4. Create orientation modules using DEDUC to permit comparative evaluation of sustainable paths vs. business-as-usual.
5. Construct prototypical cognitive structures of present-day decision making, identifying "key concepts" leading to sustainable development paths.

Enrique Campos-Lopez (Institute for Systems Studies of Arid Zones, Saltillo, Mexico):

1. Design a comprehensive methodological framework to assess natural resource sustainability or development options in a northern arid region of the Chihuahuan Desert.

Steve Chapra (Civil Engineering Dept., Texas A&M University, USA):

1. Apply a dynamic resource model to the southeast region of the USA.
2. Develop a water module for this model.
3. Develop the water sections of the management game and the book.

Victor Gelovani (Ail-Union Institute for Systems Studies, USSR):

1. Develop and apply the management game.
2. Work on the book, either individual chapters or particular examples in the Soviet Union.
3. Host a future conference of the group.

Laszlo Kapolyi (Ministry of Industry, Hungary)

1. Study the complex resource management options (including human resources) and their effects of the social-economic structure on a region.

Janusz Kindler (Resource and Environment Program, IIASA, Austria):
(While at IIASA)

1. Look at integrating the IIASA work already underway on sustainable management of renewable resources.

(After returning to Warsaw):

2. Investigate total water resource management, integrated management of surface and groundwater resources, working to prepare a decision support system with an interactive modular structure, using microcomputers.
3. Study the cost of sustainable, as compared with unsustainable, management options.

Maurice Levy (Energy Programme, UN University)

1. Study food-energy interactions, using two approaches. On the global level, use several existing global models of different paradigms to compare several scenarios. On the local level, conduct four or five detailed case studies of alternative energy solutions and technologies for increased agricultural production.

Dennis Meadows (Resource Policy Center, Dartmouth College, USA):

1. Develop a microcomputer-based game that illustrates the tradeoffs involved in achieving a high-productivity, sustainable resource system.
2. Organize a meeting that explores the key dynamics of different resource sectors.
3. Create the specifications and then raise the funds for a microcomputer system established in several groups in the Balaton Network.
4. Implement the bulletin.
5. Compile a set of case studies of successful applications of resource modeling and of sustainable management.
6. Visit other groups in the network for a week or so at a time, to consult and coordinate network activities.

Donella Meadows (Resource Policy Center, Dartmouth College, USA):

1. Compare, systematically and quantitatively, different agricultural technologies, exploring the actual tradeoffs (if any) between productivity and sustainability.
2. Prepare a textbook on comprehensive resource management.
3. Prepare and test a resource management game.

Horacio Menano (Gulbenkian Institute, Portugal):

1. Arrange for an advanced seminar on resource management at the Gulbenkian Institute, bringing together for about 2 weeks 4-6 members of this group to train some Portuguese and some foreign students.

Betty Miller (Resource Policy Center, Dartmouth College, USA):

1. Coordinate visits of Balaton Group members to the RPC.
2. Organize communications in the network; bulletin, books, conferences, etc.

Ferenc Rabar, Laszlo Lovei (Institute for rational Planning, Hungary) :

1. Investigate the best use of the biomass production of Hungary under sustainability constraints and projected economic conditions.
2. Investigate the economic consequences of a structural change toward using primarily the renewable natural resources of the country.
3. Analyze the most important long-run physical and economic interactions among natural resources.

Norwegian Groups (Resource Policy Group, Oslo, and Center for Petroeconomic Studies, Bergen, Norway):

1. Supervise a few student theses on topics undertaken by the network.
2. Connect the study of ten resources already underway at the Resource Policy Group more directly with the framework of resource interconnection and sustainability undertaken by the network.
3. Contribute to the writing and publication of the book.

John Richardson (American University, USA)

1. Facilitate design of the resource policy book, through conversations with publishers, general editing and distribution.
2. Develop a simple economic model, using concepts from the MIT national economic model, to be linked with the resource sectors.

Malcolm Slesser (Energy Studies Unit, University of Strathclyde, Scotland):

1. Work on the energy sector of the book or gaming model.

Ferenc Toth (Hungarian Bioresources Study, National Academy of Sciences)

1. Understand better the social consequences of sustainable resource management, especially income distribution and standard of living, both within and between nations.
2. Study the environmental consequences of the use of bioresources.

JOINT PROJECTS

A TEXTBOOK ON RESOURCE MANAGEMENT

WORKING TITLE:	Resource Systems: Management for Productivity and Sustainability
PURPOSE:	To communicate: - basic information about the state of resources on the earth, - the dynamics of resource systems, - the interconnections among different kinds of resources, the principles of sustainability and productivity and of good resource management, - current and future problems and opportunities in resource management, and - an appreciation for the similarities and differences of resource systems in different parts of the world.
INTENDED AUDIENCE:	College and graduate students, managers, planners, and the educated public in all countries of the world. To be used in courses, workshops, in-service training, and for self-education.
FORMAT:	A textbook, accompanied by an optional workbook with microcomputer diskette. The workbook will contain examples and exercises using simulated resource systems, upon which the student can impose different management policies. The textbook will be colorful and readable, illustrated by diagrams, charts, graphs, photographs and stories depicting resource situations in many different countries.
OTHER POSSIBLE PRODUCTS:	The exercise workbook with microcomputer programs simulating separate and linked resource sectors. A management game for day-long seminars, in which planners and managers implement selected policies in interactive mode, and learn their effects on the entire resource system. A popular book, based on the most generally interesting aspects of the textbook. An interactive museum exhibit, based on the management game. An issue of Scientific American devoted to resource management.
AUTHORS:	Resource analysts in Hungary, USSR, USA, Norway, Mexico, Scotland, Germany, and perhaps other countries (see tentative outline to follow). Edited by Donella H. Meadows and perhaps others.
DISTRIBUTION:	International. Probable translations into Spanish, Russian, and other languages.

TENTATIVE OUTLINE

I. Introduction

overview of the book and its purpose
the concept of a system
resources as systems
resource management--the implicit role of values; the values of
productivity and sustainability boundaries and interconnections among different types of resources

II. Individual Resource Systems (single modules in the computer program)

water (S. Chapra)
soil (C. Csaki and others)
forests (J. Hosteland)
pasture s/crops/livestock (C. Csaki and others)
fish (L. Ervik)
minerals (S. Shatalin)
fossil fuels (L. Ervik oil, L. Lengyel coal)
energy (M. Slesser)
atmosphere (V. Gelovani)
human resources (D. Meadows)
capital (J. Richardson)
natural ecosystems (H. Bossel)

(each of these chapters will be illustrated with data and examples from all participating organizations within the Balaton Group)

III. Coupled Resource Systems (2-3 linked modules)

renewable resources—water/soil/forest/crops
capital and energy capital and labour

IV. Total Resource Systems (all modules linked)
poverty and economic development
transition from non-renewable to renewable resources
self-sufficiency versus trade
staying within the carrying capacity

V. Conclusion
ecological principles and large-system properties
models and policy
visions of the future

ILLUSTRATIVE CHAPTER OUTLINE (Human resources as example in parentheses)

I. Introduction, explaining whatever is unique about the resource under discussion. (Human resource as very special, different from all others, both a drain on other resource systems, and also the ultimate source, not only of labor, but of creativity, purpose, ideas, technology.)

II. The global condition, brief summary of state of resource in the world and individual variations in different localities. (Global population statistics, maps showing different densities and rates of growth.)

III. Basic structural elements of the resource system, simple feedback system governing dynamic properties. (Positive birth rate loop causing exponential growth, negative loop causing decline, principle of population equilibrium. Age structure as time lag in system, illustrations of different age structures in different countries.)

IV. Inherent dynamics of the resource system, implications of the system structure over time. (The demographic transition, historical examples and future possibilities.)

V. Quality of the resource. (What is meant by human quality? Education, nutrition, and health services, matching of service capital to human needs).

VI. Typical management problems. Policy levers for managing the resource, technological options, types of interactions with other resources. (Allocating the labor force, matching students and teachers, matching labor and capital, management for creativity and productivity, ensuring that human contributions more than cover human needs).

VII. Summary and conclusion. (A special reminder that humans are more than statistics and more than labourers or consumers).

SCHEDULE

November 15	Two prototype chapter drafts (water, human resources) circulated for discussion.
November-March	Preparation of other individual resource chapters.
April	Circulation of individual resource chapters for comments and for addition of enriching material from other centers.
June 1	First draft of individual resource chapters due in Hanover for editing.
June-August	Editing of individual resource chapters, first draft of coupled resource chapters.

August 20 - Drafts of all chapters circulated for discussion.

A MANAGEMENT GAME

Accompanying the textbook will be a set of microcomputer programs, simulating individual resource sectors, linkable into a model of the interlocking resource base of any country or region. The linked model will be developed into a management game, useful for day- or week-long training sessions in which managers, planners, or students can get hands-on experience in seeing the effects of their management decisions on a complex, interrelated set of resources.

The scope of the management game will be approximately that of the resource system flow chart designed by Dana and Dennis Meadows and discussed at the conference, though it will add several sectors, such as fisheries, missing from that diagram. The game will be based on the concepts of stocks, flows, and feedback, with non-linear relationships, and it will be written in a widely-accessible microcomputer language, probably PASCAL.

Each institute team collaborating on this project will work independently, but in parallel with the other groups, to prepare a prototype game by February. In February, they will come together for a meeting to try out each other's models and to agree on the procedures for incorporating the best parts of each.

UNESCO has expressed interest in supporting a small workshop in Paris next February to design the goals, criteria, and procedures that would permit institutes in various countries to coordinate their work through use of a common micro computer system for:

- telecommunications,
- word processing,
- data base management,
- model simulation, and
- data processing.

If this meeting receives final UNESCO approval, it could be used by the Balaton Group members to make their final plans for their computer network. Tom Adler is already exploring the features and the availability of several possible machines. He will be discussing soon with the Apple Corporation, with Commodore, and with IBM procedures for donation of the microcomputers required for the Balaton Group institutes to work on a common computer system.

THE SUSTAINABLE AGRICULTURE PROJECT

Centers located in the USA, Norway, Hungary, West Germany, and Mexico (with all others invited to join) have agreed to begin a joint project on sustainable, high-productivity agricultural technologies. Over the next year, we will be engaged in two activities, gathering basic data on various farming technologies, and developing a research plan.

1. Data-Gathering

Each participating center will compile data from its own region on actual operating farms under good management, spanning as much of the spectrum as possible from pure organic techniques (no chemical fertilizer, pesticides, or herbicides, recycling of organic wastes -co the soil) to the farthest extreme of petroleum-intensive techniques (manufactured fertilizer, pesticides, herbicides, operations as mechanized as possible). Our understanding is that most farms fall somewhere in the middle of the spectrum (using, for example, mixtures of animal manure, green manure, and manufactured fertilizers) and that wider extremes may be found now in some countries than in others.

In order to educate each other about techniques in our various regions, we will each prepare a report, to be sent by June 1, 1983 to Dana Meadows at Dartmouth College, containing, first, whatever descriptive material, photographs, stories will serve to communicate to a cross-cultural audience the basic facts about the study farms, and second, comparative data from the study farms. Data should include:

- crops grown, area in each crop, rotational sequence,
- yield for each crop,
- total farm revenue/hectare,
- total farm cost/hectare, fertilizer use/hectare—type and amount by crop,
- pesticide and herbicide use/hectare by crop, loss to pests, energy use/hectare by crop,
- amount of organic waste/hectare by crop and disposition,
- labor/hectare by crop,
- soil quality, soil loss, or enhancement rate,
- effects on neighbouring ground or surface water, effects on local ecosystems, and
- quality of crop (protein content, insect damage, or whatever is an appropriate quality measure).

Suggestions are welcome about additions, qualifications, or more precise definitions of anything on this list.

2. Research Plan

Over the next year, each participating center will work to define a clear-research question and method of approach, to be presented to the other centers for consideration as a joint project. Several possible questions were discussed at the Balaton meeting, including:

> What are the actual, quantitative and qualitative, tradeoffs between productivity and sustainability in agriculture?
>
> To what extent can successful small-scale organic agriculture techniques be scaled up to an entire region or nation? What would the bio-mass flows and balances be like for large-scale organic agriculture?

To what extent can organic and chemical techniques be mixed, or phased gradually from one to the other?

In what ways might economic structures, capital and labor allocations, transportation systems, and other aspects of the larger system surrounding agriculture, promote or preclude the adoption of different agricultural technologies?

What sorts of policies would enlarge the range of options available to a nation in order to improve both the productivity and the sustainability of the agricultural sector?

Many other questions might be asked, and your ideas are eagerly solicited. It would be helpful to be as precise as possible, both about the primary question you think should be asked, and the research plan you would propose to find the answer to your question.

General suggestions can be circulated in subsequent issues of this bulletin Formal suggestions to be considered at next year's meeting should be submitted in the form of a research or funding proposal to Dana Meadows, by June 1, 1983. All proposals will be circulated to all interested groups well before the meeting.

GLOSSARY

We agreed as a group that we need and will work together to generate a glossary, translated into all our native languages, of the critical, but ambiguous, words required to describe factors governing long-term resource productivity. Our goal will be to provide for each word a definition that is simple and clear (so that, for example, a newspaper reporter could quickly understand it and find useful) while being precise and quantifiable (so that the term may be incorporated into our computer models).

Ferenc Rabar launched this enterprise by conceiving of a graph with two axes, sustainability and self-sufficiency, each on a continuous scale from 0 to 100%. Some of us asked, are those really continuous concepts? What does 0% mean? What does 100% mean? And so the conversation was launched.

Malcolm Slesser agreed to present us with some working definitions of words such as "carrying capacity", "sustainability", and "self-sufficiency". Predictably, he found it difficult to create any definitions that all members of the group would subscribe to.

Rather than recapture here all of his suggestions and our reactions, we would like to start over again by listing the words we brought up for question, raising some of the considerations we expressed, and asking for opinions and suggestions in further editions of the Balaton Bulletin.

CARRYING CAPACITY. We agree that the concept involves the number of persons at a given material standard of living that could be supported indefinitely by a given resource base.

We all recognized the many possible material living standards that might be defined. In order to compare one resource base to another, some would prefer to agree upon a "standard living

standard," an exercise obviously fraught with cultural and semantic difficulties. Should carrying capacity be defined in terms of the number of "standard Americans" supportable? "Standard Europeans?" "Standard Africans"? Should it be set at basic subsistence standard, so that its decrease when higher material standards are chosen becomes obvious? Or should it be kept loose, so that two things need always be specified, the resource base and the living standard (and, some would add, the technological sophistication and efficiency of the socio-economic system)?

What about the many varied and incommensurable things •chat make up an actual living standard and an actual resource base? Everything can be included in carrying capacity calculations, from food and water quantities and qualities, to minerals and fuels, to the environmental capacity to absorb pollution. What is the minimum package of items that must be considered? Is it only the single most limiting factor? Or in a dynamic analysis, must we consider only the factors that are likely to become most limiting? How does one find out what they are?

Obviously the concept is very complex, but if the economists could make GNP quantifiable and measurable, we can do the same with carrying capacity. If we can develop a quantifiable, broadly-accepted definition of the tern, its practical importance would eventually be at least as great as that of GNP.

SUSTAINABILITY. Is this a continuous concept or a binary one (the use of a resource is either sustainable or it isn't)? Can it be expressed for a single resource as well as a complete resource base? Is its appropriate unit "years" (number of years the resource could go on being used at current rate? or at the current rate of increase?)

Malcolm suggested an ingenious definition of sustainability as applied to a total system. It is the carrying capacity divided by the actual population. When that ratio is below one, the population is above the carrying capacity, and the system is unsustainable. At one, the system is just sustainable. Above one, the system still has room for material growth, either of population or of living standard.

SELF-SUFFICIENCY, SELF-RELIANCE. Somehow we need to use these words, or words like them, to express clearly several different states of systems (including individuals, families, villages, and nations). It is important to quantify:

- the extent to which all market demand is met by domestic production (market self-sufficiency? on a scale from 0 to 100?) the extent to which all real human needs are met by domestic production (need self-sufficiency?)
- the extent to which all market demand, and all real human needs, are met by domestic production plus trade (self-reliance? zero trade balance? Is this a quantity that changes when world market prices change?)

And if you think those were hard, here are some more:

PRODUCTIVITY. We need some way of expressing the degree to which the resource is actually yielding all it could and measuring the efficiency with which it is doing so.

RESOURCE. Malcolm Slesser suggests we subdivide this into three categories: renewable (forests, fish, water), non-destructible (minerals), non-renewable (fossil fuels).

HUMAN NEEDS.

RESILIENCE.

VULNERABILITY.

Any others?

FUNDING

How will we support the expenses of all the projects we have started? One unique strength of the Balaton Group is that its research goals are already being pursued by most of the member institutes with regional or national support. But money is required to support exchange programs, cover international travel expenses, pay for the administrative costs involved in coordinating the group's activities, and initiate several new projects.

A crucial role for the network will be to increase all its members' effectiveness in raising the money they need to participate in the overall program. This newsletter will be important in stimulating that collaboration. We will use the Balaton Bulletin to discuss individual funding requirements, prospective funding sources, and progress in securing the necessary resources.
In progress already are:

IFIAS-—Dennis Meadows and Malcolm Slesser presented the plans of the Balaton Group to a meeting of the International Federation of Institutes of Advanced Studies. The IFIAS Council expressed strong interest in the project and acknowledged its potential to complement a major effort already supported by the Federation. The Council authorized the Executive Committee to review a detailed proposal on the project and to consider adoption of the Balaton Group effort as an official IFIAS project. The role of IFIAS in securing funds for the project will wait on the Executive Committee's action and on satisfactory completion of efforts to finance the Federation's current efforts. It seems unlikely that IFIAS would be a source of funds for us over the next year, but the affiliation can enhance the quality and the impact of our work.

UNEP——A proposal has been submitted to the United Nations Environmental Program to cover the costs of the bulletin, some international travel and coordination, and the incorporation of some groups from the Third World into the network. A final decision on this could be available in early winter.

WRI——A proposal will be submitted to the World Resources Institute for major coordination funding for the network for at least its first year. A decision is expected within two months.

Rodale——A proposal will be submitted to Rodale Press to cover the first two year's coordination expenses for the sustainable agriculture project.

Hungarian Ministry for Industry——Dr. Kapolyi has informally offered to host our group's annual meeting September 3-9, 1983, in Hungary. By assuming the substantial costs of staff support, domestic travel, room, and board, he has made it possible for all of us definitely to set aside the time required for our next symposium.

AND FINALLY, THANK YOU

Most conferences do not produce the human good will, the new ideas, the ongoing projects and commitments, and the sense of potential that this one did. There are many reasons why this one did. Chief among them were the people who were there, first-class modelers and practitioners, bringing years of experience in resource policy, and also bringing a willingness to reach higher, explore further, learn more. It was a privilege to spend a week with a group like you.

In addition to the group itself, the circumstances surrounding us were most conducive to our interaction and our progress. Our Hungarian hosts provided not only a physical setting that guaranteed our comfort, pleasure, and ability to concentrate, but even more important they surrounded us with examples of resource opportunities and problems, of wise use of resource analysis, and of a pragmatic openness to new forms of problem-solving that were truly impressive. Hungary is full . of inspiring people and practices——we learned very much just from being there.

****

To continue receiving the Bulletin, each person must send some entry to be included in the newsletter at least every third issue. An entry could consist of:

- comments on previous Bulletin material, a report on work in progress,
- review of a book or paper related to the resource issues addressed by our group,
- announcements of impending meetings or conferences relevant to our research, news on potential funding opportunities,
- requests for assistance in obtaining financial support, securing data, or locating appropriate personnel for a specific project, or
- any other item of relevance.

Entries should be submitted in English, but contributors need not worry about minor grammatical mistakes.

Entries for the next issue of the Bulletin should be sent to Dana Meadows, Box 8000, Dartmouth College, Hanover, N.H. 03755, USA, by November 15, 1982. That will permit us to distribute Bulletin #2 before Christmas.