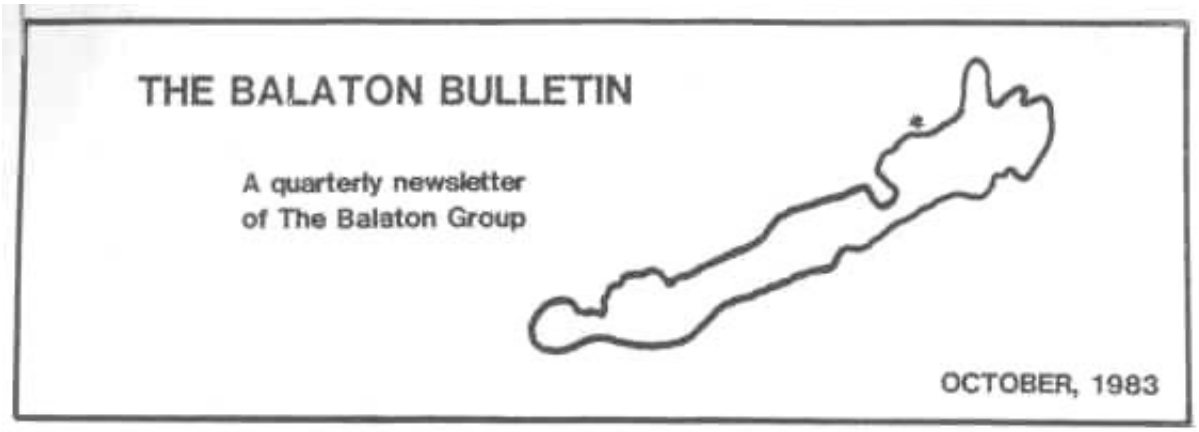

In September 1983 thirty-nine scientists, members and associates of The Balaton Group, met in Hungary to review their joint efforts on the design of new policies for sustainable, high-productivity use of a region's total resource base. They represented centers in 14 countries that have banded together informally to support each other's work on regional resource issues. In this issue of The Balaton Bulletin we describe the purpose of the meeting, list the participants, and summarize their discussions.

1; INTRODUCTION TO THE SECOND MEETING - OPENING SPEECH

by Dennis Meadows

Welcome to the second annual meeting of The Balaton Group. Last year's meeting was an experiment, an exploratory effort designed to see if we could succeed in identifying common goals that were strong enough to tie our work together over the long term and to enhance our influence on larger resource issues, even though members of the The Balaton Group live in different cultures, serve different clients, have many short-term crises to deal with, and live far apart. After five days of hard work last year, most of us concluded we could successfully build a network that would make us more effective in our work. The preliminary results of this first, tentative, year of collaboration suggests that we were right.

We all know that this meeting must go far beyond exploration. In the questionnaire Dana and I distributed to prepare for this session, I asked:

"What would have to happen at the second meeting for you to consider it a terrific success?" Most of you said. in one way or another, "develop a concrete plan for collaboration." I have excerpted several of the responses to illustrate the prevailing sentiment:

- "I would like to leave Hungary with the design for a research project that would serve the needs of the group."

Steve Chapra

- - "to agree in the formulation of a joint research program."

Ferenc Rabar

- "I think the time has come to define one common and clear goal for our effort, so that the members of the Balaton Group can manage to work in concert in the same direction with enthusiasm and vigor."

Carsten Tank-Nielsen

- "We should define better (in the operational sense) what our goals are and how each of us could contribute to their achievement."

Janusz Kindler

- “basic model structure agreed, assign responsibilities for tasks, obtain funding for on-going work, arrange exchange of senior personnel, develop appreciation of energy as a numeraire."

Malcolm Slesser

- “The meeting should involve each of us in a plan that convinces us we actually have the possibility to make a change in global resource use."

John Richardson

- “A) to arrive at a precisely coordinated program among the resource teams involved in the network with a specified scope and time frame for the work to be performed by each group.
  B) to agree on a realistic methodology for linking the results obtained by each group."

Maurice Levy

- "Coming up with a really clear program for the next few years (partially involving Third World countries) which has a real chance of impact on conventional systems of economic planning."

Jane King

Last year I said in my opening remarks, "This is not Dartmouth's meeting, and it is not the Hungarians' meeting. It belongs to all of us, and it will only be successful if each of us takes responsibility for making it work well." That warning is even more true this year. Everyone here must leave this meeting with enthusiasm and commitment, if we are to achieve the goals

you all listed on the questionnaire. You know that absolutely no one else can give you lasting enthusiasm and commitment to a research program that does not achieve your own goals and satisfy the economic and political constraints of your own center. To ensure that the research plan we develop during this coming week satisfies both those criteria, each of you will have to take personal responsibility for the success of this meeting. To prepare you for that effort, my remarks tonight will describe:

- why we are here, the large purpose of the group,
- how we got started,
- where we are now in our research program,
- who is here,
- what we need to accomplish at this conference, and
- what is the schedule for this meeting.

Why we are here

We know that natural resources are often used now in ways that are inefficient and destructive. In Hartmut Bossel's country, the Federal Republic of Germany, thirty percent of the forests may be dead or dying, probably from acid rain. In my country, the United States, hunger is increasing, toxic chemicals are building up in the ground water, many water tables are being pumped down at rates that will make irrigation economically impossible for many farms before the year 2000, and forty percent of the cropland is eroding at unacceptable rates.

In Chirapol Sintunawa's and Gerardo Budowski's countries, Thailand and Costa Rica. more than half of the forests have been cut down over the past few decades. In Jane King's homeland. Great Britain, oil reserves are being exhausted within just a few decades to maintain an economy that is structurally obsolete. In East Germany, twenty percent of the water flowing across the landscape has been pumped from a mine.

I have visited Roberto Armijo's home in Mexico. He lives in a valley that used to be covered with forests. The name of his town means one thousand springs. Now it is a desert. The forests are gone, the springs have died. and the only river nearby is filled with heavy metals from a local smelter.

We also know that natural resources can be used in ways that are efficient and sustainable. Last year we ended up our meeting with an exercise in which we imagined the way we would like our respective regions to look in the future. We are here because we shared the dream that our regions, and the world, could be changed so that the resources of the planet, everywhere, are used to meet human needs sustainably, appropriately, equitably, efficiently. and beautifully. We share the dream that the members of the Balaton Group could magnify their individual powers by linking informally to form a mutually supportive network of centers, all over the world, that use science and systems analysis to provide their own governments and people with the information needed to manage resources toward those goals, centers that:

- serve their own regions or nations,
- use the most appropriate technologies and information systems,
- combine disciplines to understand whole systems,
- communicate effectively to many different audiences,
- solve problems, not just study them,
- link with each other to share methods and data,

- take on projects with transnational significance, and,
- operate at a high level of personal and scientific integrity.

How we got started

Parts of our network already existed, informally, before last year's meeting. Many of us had worked together at The Resource Policy Center or at IIASA. Some of us were already engaged in joint projects addressed to issues of resource productivity. Gradually we decided that a major meeting might give us the opportunity to extend the group and make its overall program more concrete. The Hungarians kindly agreed to host the meeting and it was organized for last September 11-17. Thirty of us came to the last session; we came from ten nations and four international organizations. We assessed the problems, summarized our own past work, and made some agreements in support of a joint effort. We agreed to:

- raise money for joint projects.
- develop a computerized telecommunications system,
- create a newsletter,
- write a major new textbook on resource productivity.
- design a teaching game on resource policy,
- initiate several joint projects among members of the network,
- complete a glossary of critical terms related to resource productivity,
- carry out a program of personnel exchanges, and
- organize a second meeting.

We have made good progress on some of those objectives, but we have barely started on several others.

Where we are now

About $110,000 has been raised in support of our program. These funds from UNESCO, UNEP, and a private English foundation. The Resource Group, paid many of your travel expenses for this meeting. They will support Dana Meadows for a year as she coordinates preparation of the book, and they will pay expenses for a number of the Third World members.

We have adapted Telenet and Dartmouth's electronic mail system to our needs. Seven centers now use this customized telex system routinely, and it has been a great asset in coordinating our efforts.

We have written and mailed out three issues of The Balaton Bulletin with news about our efforts.

The Soviets have prepared a first draft of the resource management textbook; others have completed chapters on human and water resources. We all agree that a great deal of work must be done before any of this material is ready for publication.

We have surveyed available games and acquired several that seem to be the most useful precursors for the one we will develop. Several Balaton Croup members participated in the International Simulation and Gaming Association meeting last July in Sophia, Bulgaria.

The organic agriculture project between Dartmouth and the University of Kassel has made good progress. Dana Meadows and Hartmut Bossel visited 18

farms that have adopted sustainable agricultural practices - including zero use of petroleum-based chemical inputs. One of our students is doing research at the only organic experimental station in the U.S. this summer.

Csaba Csaki visited the Mexican member of our network to explore options for joint research. From that has come a commitment to adapting the Hungarian national agricultural model for use in Mexico.

Work on the glossary has proceeded slowly and informally through the Bulletin.

There have been a variety of personnel exchanges. Hartmut Bossel was a Visiting Senior Scientist at the Resource Policy Center for the past four months; Chirapol Sintunawa worked at the Center during August. Dana and I, Csaba Csaki, Hartmut Bossel, and Steve Chapra have all visited AZSA in Mexico. Dana and I were at the Costa Rican institute of Gerardo Budowski, and Malcolm SIesser has been working closely with the projects supervised by Jane King in UNESCO. Chirapol Sintunawa and Roberto Armijo were both at Malcolm's group in Scotland. The United Nations University has committed funds for two Third World scientists to work with Balaton Croup teams in the U.S. next year, and we have developed an internship program at Dartmouth that will make our advanced students available for short-term research appointments in affiliated centers.

Finally, we have organized a second meeting. Look around, and you will see many old friends and a few new faces.

Who is here

Personal commitments have forced a number of last year's members to miss this meeting. Jorgen Randers is waiting for the birth of his first child. Enrique Campos-Lopez is engaged right now in intense negotiations that will change the focus of his center to match the goals of our network. Csaba Csaki is in the U.S. negotiating an educational exchange program with several American universities. Steve Chapra is attending to someone in his family who is quite ill. But mainly we have all returned. We are joined by several new people, for example Joan Davis from the Swiss National Water Resources Institute, Jorgen Norgaard from the Technical University of Denmark, Chirapol Sintunawa, a professor within Thailand's principal academic center on environment and natural resources, Hans Gernert from Humboldt University in the DDR, Hilde Jervan from the Norwegian group. Genady Golubev from UNEP, Sergey Pitovranov from the Soviet center, and Georgi Tuparev from the Bulgarian mining institute. Later we all will have an opportunity to introduce ourselves and indicate our goals for the meeting.

What we need to accomplish

One year from now we need to have accomplished eight tasks. Before the third meeting we must have:

1. a good working model of long-term interactions governing the productivity of a region's most important resources,

2. an excellent, comprehensive resource management game designed, debugged, and disseminated,

3. a draft of the textbook, building on the work already done, that can serve to extend the lessons conveyed by the game,

4. a set of totally standardized microcomputer hardware and software installations implemented in each of the centers,

5. funding to support collaborative activities among our centers,

6. an active personnel exchange program to move students and senior technical staff among the participating centers.

7. a convenient electronic mail system linking all INRIC centers, and

8. plans and financing for the third annual meeting.

The schedule of this meeting has been organized to facilitate planning for the achievement of all those targets.

What is the schedule

Our meeting covers $5^{1/2}$ days. Later tonight, we will introduce ourselves to each other and indicate our goals for the meeting. Dr. Kapolyi will then welcome us on behalf of our Hungarian hosts, the Ministry for Industry, The Hungarian Oil and Gas Trust, and the National Academy of Sciences. And we will end the evening with an informal reception.

Tomorrow, Sunday, we will go by bus to the OKGT guesthouse on Lake Balaton. Sunday afternoon will be the opportunity for an extensive review of the past year's work in each center. (A summary transcript of the reviews offered by the individual participants is included as the second section in this newsletter.) Sunday evening we will play the HEX Game, a regional planning game that will provide a useful point of departure for our discussions concerning the precise goals and the form we wish to specify for the INRIC resource management game.

Each morning, Monday through Thursday, we will meet in plenary session to hear and discuss formal presentations on specific projects of relevance to our overall program. Fifteen sessions have been scheduled:

Monday

Malcolm Slesser, Jane King - An Approach to Quantifying Carrying Capacity
Roberto Armijo - Resource Management in Mexico: Current Work and Future Possibilities
Tom Adler - Using Microcomputers in the Balaton Network

Tuesday

Hilde Jervan - Resource Management in Norway
Jorgen Norgaard - A Low-energy Society with a High Quality of Life
Joan Davis - Phosphate and Eutrophication: Social and Physical Factors in a Resource

Management Problem
Sergey Pitovranov - Climate as a Resource

Wednesday

Ferenc Rabar, Artur Csetenyi, Janos Zlinsky – Environmental Protection Model for Hungary
Laszlo Lovei, Julia Kiraly - Ex-post Analysis of Hungary's Energy Consumption
Etele Barath, Ivan Futo, Peter Szalo - Second Step Toward a Territorial Model for Regional Planning
Ferenc Toth, Istvan Valyi - Methodological Background of the Biomass Project
Andras Benedek - Simulating Resource Use Across Space

Thursday

Dana Meadows, Hartmut Bossel - Sustainable Agriculture in the U.S. and Europe
Hartmut Bossel - A Microcomputer Model of Soil Nutrient Flows

Special Session

Istvan Lang - Final Report on the Study of Hungarian Biomass Potential

Monday afternoon we will identify the critical questions that must be answered by our meeting. The remainder of the time will be devoted to parallel task force meetings in which groups of 3-8 people will work to develop formal reports that address those critical questions.

In addition to the formal sessions, there will be a good deal of time for informal conversation - a chance for each of you to explore for mutual interests with those from other centers.

Concluding remarks

It is important for you to remember that the most important parts of the conference are the task groups and the informal discussions - neither of these have been planned out in detail. We have merely organized them in a way that gives you the opportunity to pursue your own goals and express your own ideas. Do not forget that this is your conference. If we are to come even close to achieving the eight goals specified above, we must use this time very efficiently. That will require your constant vigilance. This is your meeting; make sure it works for you. If you succeed in that, then this conference will surely work very well for The Balaton Group.

II: DESCRIPTIONS OF THE PAST YEAR'S ACTIVITIES

To begin the Balaton meeting, we asked everyone to summarize briefly what each group had been doing over the past year. Here, in even briefer form, is what we all said.

Tom Adler, Resource Policy Center, Dartmouth College, Hanover, NH, USA

I have been directing the Resource Policy Center graduate program in resource systems. In my research I have been working with micro-computer models for public transportation planning. These are programs to be usable by people with no computer background. I am developing these models in a network with other researchers. The Department of Transportation sets software standards, so models can be transferred between different

computers. I use an Apple 3 with 256k of memory. It can take 8000 lines of code, and that could be doubled. Also in our center Colin High is working for the Environmental Protection Agency on emerging long-range environmental problems in New England. Chuck Hewett has just completed a major project for USAID on forest management in Pakistan. We have also organized an extensive internship program for our students that places them for 3-6 months of research in organizations with interests similar to the RPC's.

Roberto Armijo, Center for Arid Zones Systems Analysis (AZSA). SaltiIIo, Mexico

We completed a land-use study for 50 rural communities in arid-zone Mexico. We are undertaking a planning support system for national and state-level 5-year plans, and a total-resource management study for the area around SaltiIIo. Csaba Csaki spent a month with us, giving a course on agricultural simulation models. Now we have prepared a proposal for a 4-year project to make a Mexican Agriculture Model. We are also bringing together experts from many specialized resource centers in Mexico to create a new systems institute, which should come into being next January.

Etele Barath, Institute for Town and Regional Planning, Budapest, Hungary

We have been developing a resource-oriented model dealing with interactions between regions and different resource-use sectors. This year we finished the second step; the subsystem evaluating the pattern of land development of a region. We have examined the consumption structure of the complex energy system, and identified the factors that explain each region's special energy consumption patterns. Meanwhile everyone has also done the everyday work of teaching, research, and programming.

Hartmut Bossel, Environmental Systems Analysis, Gesamthochschule, Kassel, Federal Republic of Germany

At the University of Kassel we are working to create a new institute of resource systems. We have been working on the dynamics of forest ecosystems and of acid rain. We have completed a project on alternative energy systems for the city of Kassel. We found that conservation and biomass are the most cost-effective energy sources. We have also done a study of potential small hydropower sites for the state of Hesse. I spent several months on leave at the Resource Policy Center at Dartmouth. There I adapted some small system dynamics teaching models for pocket calculators and for microcomputers. I developed a rather sophisticated soil/water model and nitrogen/crop-rotation model for the small Epson computer. I also consulted with the group in Mexico on a non-numerical systems analysis approach.

Joan Davis, Swiss Federal Water Research Institute, Zurich, Switzerland

I work both within the Institute and also on projects with various Swiss environmental groups. One of these is the phosphate project I will be reporting to you Tuesday morning. We have also been studying the difference in water pollution between organic and conventional farming, and we have been demonstrating the retrofitting of buildings to reduce their energy consumption by 80%. We also write books to change the European mind set about resource use and consumption. I have an opportunity for significant new . financial support on a study of global nutrition, resources, and population, and I am designing that project.

Tanja Dostoynova, Institute for System Studies. Moscow, USSR

My time was devoted to the problems of coordinating the work of the Soviet group members for the chapter drafts of the book. I also prepared for assembly the regional model of a resource system in which I had to construct the human resource submodel.

Victor Gelovani, Institute for Systems Studies, Moscow, USSR

We have prepared a complete draft of the resource book for the Balaton Croup. We are working on water modeling. We are also continuing our educational activities in the academy of management, presenting the decision-makers with regional models, through which they can learn the contradiction between short- and long-term outcomes. We are nearing completion of our global model, which has 9 regions, and we are beginning a model for the Soviet Republic Georgia that will assist regional decision makers in the evaluation of actual policy alternatives.

Hans Cernert, Humboldt University, Berlin, German Democratic Republic

I make management games, several of which are used in university teaching and in continuing education programs for managers. They can be powerful tools, especially for systems that cannot be described fully by mathematical equations. We have built an East-West trade game, based on simulated firms in England and the GDR. We have a new game on industrial enterprise in the GDR; it is a simulation model comprised of about 4000 FOR-TRAN statements.

Genady Golubev, United Nations Environmental Program, Nairobi, Kenya

UNEP is oriented toward the same goals as the Balaton Group. It was founded in 1972, when its main concern was pollution. Now the concern is proper management of natural resources. UNEP is purposely small; it operates primarily through other UN and non-UN organizations, acting as a catalyst. There is a training center in Madrid for environmental education in the Spanish-speaking world. There are demonstration centers for rural energy use. The global activities, such as atmospheric carbon dioxide and monitoring resources, mostly interest the developed countries. The developing countries are more interested in national- or regional-level planning. There are 15 major programs, including atmosphere, water, oceans, terrestrial ecosystems, human settlements, environmental diseases, environment and development, environment and the arms race. These include more than 200 projects. We never support basic research, we do not support any project for more than 5 years, and we never provide 100 percent of a project's financing. The programs that currently have priority are water, desertification, regional seas, education and training, and the global environment monitoring system.

Tamas Jaaszay, Technical University, Budapest, Hungary

I work to identify policies that will facilitate technical innovation in the Hungarian economy. In particular we have been studying the interaction between the use of natural gas and electricity and the options for storing natural gas. I am also a Hungarian delegate to the World Energy Conference, and I chair its Energy Conservation Committee. Recently we completed a study on energy conservation in buildings, and we are about to start a three-year study on energy use in agriculture.

Jane King, Carrying Capacity Project, Population Division. UNESCO, Paris, France

I am starting a $1^{1/2}$ year study of carrying capacity in Kenya, in a joint FAO/UNESCO project. In three other countries—South Korea, Thailand, and Sri Lanka—there are preliminary descriptive studies going on. These are intended to lead to more detailed, quantified carrying capacity studies. I am trying to find funds to continue these efforts. We have begun to get carrying capacity into the U.N. jargon. We wrote a paper for the UN Fund for Population Activities 1984 conference on population, based on ideas developed at the first Balaton Group meeting last year.

Istvan Lang, Hungarian Academy of Sciences. Budapest, Hungary

This has been the driest year of the century in Hungary, and our agriculture suffered very much. This has caused us to launch a study of the interrelationships between yields and ecological conditions. We will do field studies on 6000 large agricultural plots. We want to find out how to make Hungarian agriculture less susceptible to climatic shocks.

Maurice Levy, Energy Program. United Nations University, Paris, France

As Director of the UNU Energy program, I have worked to make UNU fellowships available for scientists from the Third World to participate in INRIC centers. The UNU food-energy project is not moving very fast. We now have 3 global models running similar scenarios—that was difficult to do, because the models are so different. We are learning that the trade problem—the choice between importing food or energy—is a central issue. I have been looking for a French group to join the network. We have also taken out some old French land-use models that didn't take resources into account, and now we are incorporating resources into them. The UNU energy project now includes 12 integrated rural development projects. In a project with the Canadian International Development Research Center we are creating a group comprised of 10 senior scientists from developing countries to assess the energy needs and potentials of the Third World. There will be at the UNU a new project on climatic/biotic/human interactions in the humid tropics. And we hope to be able to start a new institute for natural resources in Africa, to open in the Ivory Coast in 1984-85.

Dana Meadows, Resource Policy Center, Dartmouth College, Hanover, NH, USA

I have edited The Balaton Bulletin, raised funds, and extended the network to Third-World centers. I have also been working on the resource management textbook. Next year I have a grant that will allow me to spend full time on these activities. I also arranged a conference this year, bringing together over 30 grassroots leaders of poor communities from all over the globe; the Gandhis of the modern world. They inspired me greatly by demonstrating the importance of the people's own efforts to improve their resources, and their power to do it.

Dennis Meadows, Resource Policy Center. Dartmouth College, Hanover. NH, USA

I have spent this past year on a variety of activities in support of The Balaton Group. I have raised funds for this meeting and for several activities that will enhance collaboration among our centers. I visited Balaton Croup centers in Mexico, Costa Rica, the U.S., and Europe. I have completed two major reports on the strategies a resource policy center may have adopt to have greatest impact on policy makers in its region. I have been exploring for the best organization to serve as a secretariat for our network's activities. I have become familiar with the discipline of operational game design and implementation.

Betty Miller Resource Policy Center, Dartmouth College, Hanover. NH, USA

I have provided administrative support for many of the collaborative activities of the network. I did research on potential funding sources for INRIC, helped organize this meeting, disseminated the Bulletin, and operated the mail system. I made most of the arrangements in connection with Hartmut's and Chirapol's visit to the Resource Policy Center.

Jorgen Norgaard, Technical University of Denmark, Lyngby, Denmark

I have been working with Niels Meyer and others on dynamic modeling of the Danish energy system. My emphasis has been on the demand side—how little do we need? We also did a detailed study of a small community and found a huge potential for energy conservation. With other energy analysts we have Just finished an alternative energy plan for Denmark. Three years ago we also prepared a pilot project for a sustainable energy system for all of Scandinavia. There is now a new Scandinavian study on an alternative plan for the total development in the region. We teach courses on resources and on system dynamics. In general. I work on creating a low-energy society with a high quality of life.

Sergey Pitovranov, Institute for System Studies, Moscow, USSR

I have been working on the climate and atmosphere resources chapter for the Balaton book. I am also working on the climate sector of the nine-region global model, which is nearing completion in our institute.

Chirapol Sintunawa, Mahidol University, Bangkok, Thailand

I am on my way back to Thailand to teach system dynamics in a graduate program on environment and resource studies. I have just completed a doctoral thesis with Malcolm Slesser in Scotland on the possibilities for energy production from biomass in Thailand. I also spent a month at Dartmouth, doing system dynamics and preparing my course for the coming term.

Malcolm SIesser, Energy Studies Unit, University of Strathclyde. Glasgow, Scotland

During the year the Energy Studies Unit devoted some 3 man-months to developing its energy for energy approach to total resource management. This was based on the exiting PIE-em model of global energy supply which was rendered into a simple gaming model in FORTRAN. As it stands, the model is in a primitive state using pilot data, and it needs a great deal of elaboration. Even so, it can be used to study the impact of population growth, changes in consumption patterns, availability of certain energy technologies, and consumption-to-investment ratios.

In conjunction with UNESCO an existing methodology for estimating carrying capacity and its enhancement through changes in investment in food production and energy supply was brought to a preliminary stage in preparation for analysis of the Kenyan situation. The objective is to have a total resource management model in which resource sectors are linked to the energy numeraire. This model can then be developed in association with national groups in those countries interested in carrying capacity studies. An early application of this is likely to be Kenya.

Carsten Tank-Nielsen, Resource Policy Group, Oslo, Norway

I delivered a report to the Norwegian Department of Environment about the Balaton Group. They were very interested. The resource modeling project I reported on last year is now 2/3 finished, and we will give a longer report on it later in this meeting. After the talk about gaming last year, I got out the forestry gaming model we developed some time ago and sent it to Dennis for the use of anyone interested.

Ferenc Toth, Hungarian Academy of Sciences, Budapest, Hungary

I have made a system dynamics model of the Hungarian forest sector. I have also been studying gaming. 1 spent the summer as a Young Scientist at IIASA, where, among other things, I took a short course on environmental assessment using microcomputer models.

Istvan Valyi, Hungarian Academy of Sciences, Budapest, Hungary

My primary goal has been to complete the Hungarian Academy of Sciences biomass study. I have also been working on the soil resources chapter for the Balaton book. We are now just beginning a soil resource utilization model for Hungary. I worked on the forestry model for the biomass study.

III. TASK FORCE REPORTS

During part of the meeting we divided into five groups to work on five areas of concern to all the network centers:

- administration
- management game
- resource textbook
- microcomputer standards and electronic mail
- resource glossary

The working groups met. developed an interim report, considered comments by the Group members, and produced these final reports. Further comments and discussion through the Bulletin are welcome.

Task Force #1: Administration Group

CONTRIBUTORS:

Joan Davis
Betty Miller
Jane King
Maurice Levy

Number and type of members; For the time being, the Balaton Group should not exceed 35 members, assuming we want to have between 25 and 30 at the meetings. There should be two types of members: centers and ad personam (a. p.) members. Centers do not always need to be represented by the same person, whereas a.p. members cannot send substitutes. When the Balaton Group meets, the host country may send an appropriate number of observers upon consultation with the meeting organizers. Centers should satisfy the existing guidelines for membership. Each center should;

- include world-class resource analysts.
- strongly emphasize practical solutions to important, local. resource problems,

- demonstrate that its past and current work has influenced corporate or public resource management efforts, and
- be reasonably assured of continuing financial support from national sources.

A. P. members should be selected for their interest in resource analysis and their ability to contribute to the goals of the group. They may also be previous members of centers associated with the group.

As of now center members who have been invited to join the network include:

- The Resource Policy Center, Hanover, NH, USA
- The Center for Arid Zones Systems Analysis, (AZSA), Saltillo, Mexico
- Center for Agronomic and Technological Research and Training (CATIE), Turrialba. Costa Rica
- The Resource Policy Group, Oslo, Norway
- The Energy Studies Unit, University of Strathclyde, Glasgow, Scotland
- The Institute for Environmental Systems Analysis, Gesamthochschule, Kassel, Federal Republic of Germany
- The Institute for System Studies, Moscow, USSR
- The Department of Resource and Environmental Studies, Mahidol University, Bangkok, Thailand

Other groups in Denmark, Portugal, Switzerland, and Hungary may join the network within the coming year. The association of centers will be known as the International Network of Resource Information Centers (INRIC). One group of scientists representing the INRIC centerswill meet for a week once a year; these individuals will be known as The Balaton Group. Everyone who has attended either the first or the second Balaton Conference is presently considered an ad personam member of The Balaton Group.

New members: Whereas membership has been decided so far on the basis of professional affinities, completion of the group should reflect our desire to achieve:

- a reasonable geographical coverage,
- a more complete representation of the various resources, and
- a better representation of developing countries.

New members should preserve the congenial atmosphere of the meetings and have the general support of the group, verified either through the electronic mail system or at meetings of The Balaton Group.

Discontinuing memberships: When a center or an a.p. member has become inactive within the group or chooses to resign for some other reason, the membership may be terminated. When representatives of a center leave it. the center's membership should be reconsidered.

Legal Status

Primarily for fund-raising purposes, the group should be registered as a non-profit organization in the United States (and perhaps later in other countries). It would then have a board of trustees which would be composed of prominent personalities having strong interest and expertise in resource development and management. It should also have a director.

Letterhead and Logo

It would be useful to have letterhead stationery for use by the group members, particularly for their relations with other institutes and for fund-raising. It would have a logo and the following heading:

INRIC:

International Network of Resource Information Centers

The names of the members of the board of trustees and of the director would appear on the left-hand side.

Song and Wine

The composer friend of the Viola Ensemble (the traditional music group that played at our opening session in Csopak) should be asked to write a song for the Balaton Group: the mood should be somewhere between pastoral and triumphant. A special reserve of an appropriate wine from the Balaton area should be selected bearing the group's name and logo on the label. (The American editors add: a group T-shirt is also an absolute necessity.)

Newsletter

The Balaton Bulletin should remain a quarterly publication, primarily for use within the Group .Members should send their contributions in a language and format which can be readily used for publication. Every year, one issue of the Bulletin, preferably the January edition, should summarize the activities of the group in the past year and should be written in such a way that it is appropriate for a wider distribution. This would facilitate relations with other organizations interested in resources and could be used for fund-raising. Other organizations should be encouraged to contribute items on a reciprocal basis for reproduction in other issues of the Bulletin. The circulation policy will remain the same as last year except for the one special issue.

Exchanges Within the Network

The electronic mail system should contain files for general information accessible to members. Of special interest would be:

- a fellowship and internship data base listing all positions within the network available to other members and
- a list of meetings and planned trips by group members.

This should facilitate invitations of INRIC scientists to speak at other centers. The core funding should allow for coverage of the marginal costs incurred during such visits.

Core Funding

Funds of the order of $100,000 per year are needed to cover expenses for coordination, communication, and meetings within the network. These would provide payment of expenses connected with:

- The Balaton Bulletin,
- the electronic mail system,
- travel to recruit new members.
- special fellowships,
- the annual meeting of the group, and
- related activities.

Additional funds will probably have to be raised in connection with specific joint projects (i.e. game, book, etc.).

A concerted effort should be made to raise funds in order to assure continued support of the group. Members should either inform the director of funding possibilities or contact organizations directly and inform him of the contact.

Next Meeting

The next meeting should take place in September, 1984, preferably during the first week. It should last no more than five days, as at present. The location should:

- be in a peaceful surrounding, away from an urban center,
- offer living and meeting quarters at the same location, thus enabling participants to be together 24 hours/day,
- include a grant from the host to cover local costs, in order to free INRIC funds for travel expenses.

Negotiations need to be conducted regarding the location, without foreclosing any options. Members of the group should contribute any information they have on possible locations satisfying the above criteria. (Final arrangements for the third annual meeting have now been made; they are listed on page 29 of this newsletter.)

Task Force #2: Design of the Resource Management Game

CONTRIBUTORS:

Jozsef Balogh
Andras Benedek
Tanja Dostoynova
Hans Gernert
Genady Golubev
Hilde Jervan
Laszlo Lovei
Dennis Meadows, Chairman
Chirapol Sintunawa
Malcolm SIesser
Zoltan Szirmai
Ferenc Toth
Istvan Valyi

TITLE:

REMAN-1: A Management Game on Principles for Sustained High Productivity of a Region's Total Natural Resource Wealth.

PURPOSE:

We developed plans for an operational game that will:

- attract and hold the interest of senior public managers for a 1-2 day teaching seminar and workshop on natural resource management policies,
- be adopted widely (at least 20 organizations in the first year after its release) for use as one unit in academic courses on natural resources,
- convey to the players generic principles of sustainable, high-productivity, comprehensive, regional resource management, and
- create among clients of all the INRIC centers a common awareness of long-term resource problems, and a common interest in sponsoring and using research relevant to the INRIC program.

The game is not intended for use in designing detailed solutions for the specific problems of any particular region. Instead, it should strongly convey a set of generic principles, general rules that convey important insights about solutions to long-term resource problems in every region.

INSIGHTS:

The game should convey the following insights:

1. Exponential growth in population and capital exhibits certain relationships between each stock and its associated rate of increase - for example, the effect of growth rate on a stock's doubling time and the difference between rate of growth and absolute increase.
2. The determinants and the magnitudes of a population's birth and death rates pass through certain characteristic phases during the course of the demographic transition.
3. Capital investments impose significant delays on the system; once placed in one sector, capital normally cannot be moved; once it is put in place, an investment continues to impact on the system for the capital's full lifetime, often 25-35 years or more.
4. The cost of measures to protect the environment are generally much lower if the measures are taken early before great damage has already been done. But early investment in environmental protection does deprive the society of some physical production over the short term.
5. Some environmental processes, for example pollution of groundwater, may involve enormous (25-75 year) pipeline delays, posing very difficult problems of environmental management.
6. A gap between what is wanted and what is produced may be eliminated either by producing more or by wanting less.
7. Regeneration of renewable resources involves several quite general relationships among growth, fertility, harvest, death, the resource's sustainable yield, and its standing stock (or population).
8. The marginal productivity of investments typically declines with increasing intensity of exploitation of a resource.
9. Depletion of a nonrenewable resource generally raises the inputs required to produce the next increment of output.
10. The short-term results of a resource policy may be opposite in direction from the long-term results of that policy.
11. Technological change can alter the precise timing and impact of any relationship mentioned above, but it cannot permanently eliminate any of them for any resource.
12. Interconnections among resources can often mean that measures taken to increase the utilization of one resource will raise or lower the productivity of others.

CHARACTERISTICS OF THE GAME:

To convey these lessons the game must have several features. It must:

- be possible to "win" the game (achieve adequate consumption levels for the population while maintaining the productivity of the total resource base at sustained high levels). It must also be possible to "lose" the game.
- have a structure and a set of playing steps that can be adapted to represent either a market or a centrally-planned economy.
- incorporate the rate of employment as an effective index in the game.
- offer the players a realistic set of technological options.
- have a design that permits manufacturing the game rather cheaply and have documentation that will permit those unfamiliar with the game to conduct it successfully.
- use a microcomputer that is cheap, reliable, and user-friendly.
- stand by itself as a valuable, independent unit in an existing course, and it should also serve well as the core of a 1-2 day workshop on resource management.

The workshop should be designed to convey the principles, make them plausible, help policy makers determine their relevance for problems they must solve in their own region, and secure some commitment from participants in the workshop to implement concrete actions after they return to their organizations. Users should recognize that other indices than short-term profits are important parts of the goal in managing resources. They should want to learn more about resource dynamics, be sobered about the potential for serious damage to a region's resource base, and inspired that appropriate management efforts can produce significant gains in the quality of life for people in a region.

STRUCTURE OF THE GAME:

The game will have eight generic sectors: population, energy, water, forests, agricultural land, minerals, industry, and fossil fuels. W6 will work 'out the precise causal structures of each sector and their interrelationships during the first phase of the task force effort that develops the game. Preliminary versions of the forest, water, and agricultural land sectors were prepared by members of our group during the second conference.

REMAN-1 will be an n-person (6-20 player), iterative game with each cycle representing 5 years, and the full game constituting 20 cycles - one century. Intersectoral bargaining, an important feature of the HEX game. will not be significant in REMAN-1. Instead, each cycle will consist of the 1-3 players in a sector analyzing data on the current status of the simulated system. After taking into account ail relevant constraints, goals, and other information the sector will make its decisions (probably each sector will have 3-6 policies available to it). The decisions from each sector will be entered into the accounting process, which may be programmed on a microcomputer accompanying the game or may be a set of manual procedures, and the results will be calculated. The new state of the system will be reported to the relevant sectors, and the decision process will begin again. An example of how this cycle might work for the forest sector was worked out in detail by Hans Gernert and Chirapol Sintunawa. Their design, prepared as a separate appendix to this report, is available upon request from The Resource Policy Center.

ORGANIZATION OF THE TASK FORCE:

A central staff, with 2-4 people directed by Dennis Meadows will work on the project November 1983 - July 1984 either at IIASA or at the Resource Policy Center of Dartmouth. There will be a small, approximately 7-person, advisory council and several associated centers.

The work should start in earnest November 15, 1983, and a polished version of the game with associated documentation should be available for distribution July 30, 1984.

SCHEDULE:

Nov. 15 Start of the project at IIASA or the RPC with Meadows and a task group of 2-4 full time people.

Dec. 15 Complete a generic system dynamics model that expresses the structure of the game and allows testing of its basic behavior modes, dimensional assumptions, etc. Conduct advisory council meeting #1 to critique the structure.

Feb. 15 Finish the preliminary version of the game. Run it at IIASA with IIASA staff. Identify necessary changes.

Mar. 15 Finish revisions. Conduct advisory council meeting #2 to play the game and critique it. Include several representatives of the 20 non-INRIC centers that will use the game in their educational programs. Adapt the game to represent specific regions of interest to INRIC members.

June 15 Receive detailed evaluations of the game.

July 15 Send out final versions of the game to all Balaton Group members and to 20 cooperating institutions.

BUDGETS:

<u>Central Task Group Effort</u>

2 micro computers provided by institute	
Meadows salary	
2 assistants	
12 months each	$ 24,000
2 Advisory Council Meetings	
2 x 7 members x 2 days/meeting x $ 50 days	1,400
4.r.t tickets	2,000
Electronics Mail System	600
Reference Materials	500
Purchase 4-8 games for experimentation	1,500
Produce 40 copies of the game	4,000

3 Workshops, 2 staff members – 4 days	
Medico	
Boston	
Budapest	12,000
TOTAL	$ 46,000

Corresponding Center Effort

Each center will participate in 2 Advisory Council meetings Dec. 15, 1983 and March 15, 1984. Each will test the pilot model April 15-June 15 and submit detailed evaluations. Each will take the final game, adapt it to their region, and develop a 2-3 day workshop for managers in their region based on the game.

	Low	High
2 council meetings – travel	-	3,000
Pilot test	-	3,000
Dev. Workshop	1,000	4,000
Conduct 3 workshops	3,000	10,000
Microcomputer	1,500	5,000
Electronic Mail	600	1,000
Reference Materials	-	500
Total	$ 6,100	$ 26,000

Task Force #3; Preparation of the Resource Productivity Textbook

CONTRIBUTORS;

Dana Meadows
Victor Gelovani
Sergey Pitovranov
Carsten Tank-Nielsen
Jorgen Norgaard

Desired Results

We would like to have the book accomplish the following results:

1. Be actually read by decision makers in all our countries.
2. Be adopted as a university textbook and read by students in all our countries—therefore be accepted and not criticized by the academic community.
3. Instill in the minds of the readers lessons related to:

- basic dynamics of different kinds of resources,
- interconnections among different kinds of resources,
- transnational effects of local actions,
- the similarities and the differences in management of resources all over the world—to foster empathy and tolerance,
- the many real opportunities for high-productivity, sustain-able resource use and the

potential for management on the demand side, as well as the supply side.

4. Demonstrate to the world an inspiring example of international cooperation

5. Bring credibility, honor, and resources to the participating centers.

6. Make money for the activities of the network.

Design Features

There need to be two books; one more serious and weighty (but still interesting and clear) for the universities, and one more short and light for decision-makers. We will do the textbook first. It will be a joint effort with inputs from many centers. The short book should be extracted by just one or a very few persons.

2. The book will contain:
   - chapters on the dynamics of individual resources (introducing basic systems concepts and the simple behaviors of exponential growth, depletion, regeneration),
   - chapters on coupled resources (to illustrate with a few examples how interacting sectors alter each others' dynamics). And
   - chapters on total resource base. parameterized for different ecosystems (tropical forest, northern forest, temperate agriculture, grassland, etc.).

3. There will be small computer simulation programs for each kind of resource, to be linked for the total-resource program. These programs should be usable on the widest possible variety of microcomputers. They should be consistent with, and may be the same as, the management game.

4. The book should be full of short descriptions of good resource management , for all kinds of resources in all parts of the world. MEMBERS OF THE '5ATATON GROUP ARE REQUESTED TO SUBMIT THREE (3) GOOD-NEWS STORIES TO DANA MEADOWS BY DECEMBER 1, 1983. Several of these stories will also be printed in The Balaton Bulletin.

5. The book should be fully factual and documented, but also extremely clear and readable - superbly effective as a learning tool. It should have colorful, memorable graphs, maps, and photographs.

6. It should be as uncomplicated as possible, consistent with the necessity for academic acceptance.

Sample Chapter Outline (forest resource)

1. Overview - historical, global, and regional figures for standing biomass harvest rates; qualitative differences - softwood/hardwood, distribution, species differences, etc.
2. Uses of the resource - maintaining the ecosystem; human uses - fuel, paper, lumber, etc.
3. A few examples of good and bad management chosen to illustrate main dynamics of the resource. (Costa Rica - deforestation; E. Europe -acid rain; Oslo - protected forest around city)

4. Structure - simple simulation model illustrating undisturbed resource (succession, growth to climax); human intervention (harvesting, fertilizing, reforestation); complex model as an example.
5. Policies for sustainable management - many more good examples (agrofor-estry in Costa Rica, Scandinavian forest policy); - demand side too -efficient woodstoves, etc.
6. Interconnections with other resources.
7. Exercises for student.

RPC 10/1/83

Tentative Schedule September 3-9, 1983 - settle schedule and responsibility for tasks

chapter writing	all responsible

January 1. 1984 - 1st draft of all single resource chapters due

chapter editing for consistency	DHM

March 1, 1984 - 2nd draft of chapters completed and entered onto word-processor diskettes.

circulation chapters	all who choose to of review specific chapters

May 1. 1984 - chapter comments due, preparation of semi-final draft

synthesis of combined-resource chapters	MEETING AT IIASA TO PLAN NEXT PHASE

July 15, 1984 - complete draft - semi-final

circulation of whole book	entire network

September, 1984 - NEXT BALATON MEETING

final compilation of comments, stories, photos, graphs, charts, final editing, completion of maps, etc.	DHM

December, 1984 - final draft, ready for publishing/translation

Responsibility for Chapters

Forest Fish	Carsetn Tank-Nielsen
Human resources Capital resources	Dana Meadows (with the MIT System Dynamics Group)
Climate Minerals	Victor Gelovani/ Sergey Pitovranov
Fossil fuels	Laszlo Lengyel
Soil & Crops	Istvan Valyi (with Csaba

	Csaki and the Academy of Sciences biogresource study)
Water	Joan Davis (with Steve Chapra, Janusz Kindler, Genady Golubev)

Relation of the Game to the Textbook Project

The gaming committee decided it would be crucial to have a small text book reaffirming the principles of the game. This must be accessible to senior managers who have no expertise in the use of computers. It would be handed out at the conclusion of the workshop, and it might even be used as a text during part of the 1-2 day seminar. The book should offer many case studies, and it should be organized by principle, not by resource.

The textbook committee identified two books to write. The highest priority will be given to a large text, organized by resource and designed for use in universities. The first part of this text will present a set of resource models that may be adapted for use in sectors of the game. The final chapters of the textbook, on the behavior of total resource systems, should be close to, if not identical with, the small book needed by the gaming group.

If the system dynamics model that is postulated for incorporation in the game should turn out to be appropriate for use in the large book, it will be taken over by the book group. Members of the game advisory council will be selected from the group of chapter authors, so as to maximize the possibility for complementarity between the two efforts.

Task Force 4: Organization of the Microcomputer System and Electronic Mail

CONTRIBUTORS:

Tom Adler	Ivan Futo
Roberto Armijo	Istvan Valyi
Hartmut Bossel	

1. Survey of INR1C Centers Computing Systems and Computing Needs in 15 centers. (The original questionnaires are available from Adler to those desiring precise data on responses by The Balaton Group.)

    1. Computers being used.
    Most groups have access to large central computer systems or central minicomputer systems. Most minicomputers are either PDP's or VAX's. Relatively few groups have micros, mostly Apples.

    2. Computer languages and software.
    The most commonly used language is FORTRAN, with PASCAL and BASIC second and third. Most groups have DYNAMO available; some have their own software for dynamic models.

    3. Typical tasks

The development of system dynamic and linear programming models is the most common task, with text processing as another important activity.

4. Number of people using the system.
   The number is between 2 and 20, with most groups housing less than 10 people.

5. Mail system
   Practically all groups would like to join the mail system (if they haven't already). However, some have administrative, financial, or technical difficulties.

6. Financing of micro system.
   Most Western groups would probably finance their own system. Some need at least a small financial support in order to obtain local funding. Groups from Eastern and Third World Countries generally need financial assistance, even if the system would be bought in "soft" currencies.

7. Requests from other centers.
   Generally, an exchange of publications and reports is desired. Also, most centers would welcome an exchange of models, software, methodological experience, etc. This would necessitate a periodic publication of available work, perhaps in the Balaton Bulletin. Most centers also expressed an interest in the exchange of personnel.

8. Offers to other centers
   See 7:Most centers can offer some specific software, models, know-how, methodology etc. to whoever is interested.

II. Network Computer and Balaton Mail System.

The current use of Dartmouth's DCTS system through TELENET seems satisfactory for simple message transfers. The major problems encountered so far are the closing of the system for four hours during the European mid-morning period and the incompatibility of the DCTS system with three of the four TELENET carriers. Over the longer term, a more serious problem is the unfamiliarity of almost anyone outside of Dartmouth with the DCTS operating system. This will make use of this computer by other centers for file transfer (up/down loading) and other more demanding computer activities very difficult. Since both IIASA and the Saltillo group operate VAX systems under the same UNIX operating system as the second computer in the Kiewit network and since UNIX is a more universally used operating system, we should consider switching the network including the message transfer system to one of the Dartmouth's VAX's (still accessed through TELENET). This change will be explored by Tom Adler.

III. Microcomputers

We began by identifying the major uses to which Balaton members would likely apply their microcomputers, as listed below:

1) Use as "smart" terminal. The computers must support telecommunications for connections to the central network computer. Capabilities should include up- and down-loading of files.
2) Support model and game development and use. The computers must be

sufficiently powerful and the software must be sufficiently available on a range of computer types to ensure dissemination of the results.

3) Use for text processing. The computers should support local text processing and transfer of text through the central computer.
4) Use to manage and transfer data bases. Capabilities for management of modest-sized databases should be available.
5) Use for analysis. Software for tabulation, graphical analysis, and limited computation should be available.
6) Use for lectures/field analysis. Special constraints imposed by these applications, e.g. portability, should be considered in the selection of microcomputers.

Hardware Standards:

Recognizing that some centers already have investments in microcomputers and others will acquire hardware to adapt to specific needs, we would encourage the adoption of software-based standards as a minimum pre-requisite to Balaton-related work. For the acquisition of new computers with funding obtained through Balaton auspices, and where possible in independent acquisitions, we recommend adoption of a hardware standard which will be determined according to the following criteria:

1) Hardware capabilities
   - memory capacity (64k minimum, expandable to at least 256k)
   - standard peripherals interfaces
   - portability

2) Software availability
   - size of software base
   - ability to meet software standards

3) Cost of new acquisitions
   - price
   - cost-sharing or donations

4) Hardware currently used by members

Based on these criteria, we recommend the IBM PC as the Balaton group's "standard" hardware. This recommendation is supported by several factors:

1) The IBM PC is a 16-bit machine, with capability of expansion to at least 1 megabyte. Although it is not "state-of-the-art," it does appear powerful enough for most of our activities.
2) It has a large and rapidly-expanding user and software base. The currently available software base includes packages that conform to our software standards (see below).
3) Although we may not be able to get a direct donation from IBM. it should be possible to get discounted equipment, at least for centers associated with academic institutions. The IBM equipment is sufficiently more attractive than the Apple lie's offered through the Apple Foundation that we will not submit an application to Apple.
4) There are available software-compatible portable computers, for example, the Compaq and the Corona, which would meet the needs of several centers.

5) There is a Hungarian look-alike called the Proper 16, which has almost identical specifications and software compatibility with the IBM PC. It will be available to East-Bloc centers.

Software Standards:

We agreed that adherence to both general and specific standards for software development and for software packages used is critical to many of the INRIC activities. We discussed standards related to each of the likely uses identified earlier.

1) Programming languages. All software development, including specifically the model and game, should be done not only in a common language, but also in a common version of that language. Our recommendation is that PASCAL, particularly the UCSD version, be used as the "standard" language for development. This language has been widely adopted as a microcomputer standard because of its modern structured design and because use of the pseudo-code compiler implementation of the UCSD versions allows direct translation among different types of computers. We recognize that some centers will not have enough familiarity with this language to begin use for near-term projects, so we recommend use of BASIC (Microsoft implementation) in cases where use of PASCAL is not now possible.
2) Analysis software. At the least, we should select a single spreadsheet-type package. Likely candidates include VISICALC and SUPER-CALC[2], both of which appear satisfactory in meeting our needs. A final selection will be made based on price and other factors, such as ease of file transfer through the network computer, about which we had no information at Csopak.
3) Text processing. As with spreadsheet packages, there is wide array of available software. Ability to transfer text through the central computer without special control characters that might violate protocol is a central concern, along with price. A final selection will be made following a more detailed review of available packages.
4) Data base management. Issues are identical to those cited in 3).
5) Modeling software. Since a number of centers use the system dynamics methods. Micro-Dynamo (which is written in UCSD Pascal) is recommended as one of the simulation packages to be used. Roberto Armijo will look into development of a Pascal version of his group's goal programming algorithm. We should also identify econometric/statistical packages, and others as need by group activities.
6) Documentation. If we really expect to share models and other new software, we must agree to documentation standards. For PASCAL or BASIC programs, internal documentation should define all variables and describe the basic program structure. External documentation should define meaning and units of all inputs and outputs and should describe the minimum hardware configuration required for operation.

IV. Implementation

Funding: The number of new micro-computers required appears small (3-5), meaning that an approach to IBM or use of general Balaton support money may be possible.

Completion of standards: The micro-computer subgroup will correspond by the mail

system to complete details of the standards. Recommendations will be posted in Balaton Bulletins, and if no objections are received prior to copy deadline for the subsequent issue, they will be considered adopted.

Review: Because of rapid change in micro-computer hardware and software, we recommend annual review of major elements of the standards and of progress toward the objective of adequate (micro) computing resources at each center.

Task force #5: Compilation of the Resource Glossary

The indefatigable Malcolm Slesser once again took on the job of trying to coordinate our efforts to define some of the key words we need to create a precise, internationally-understood language for discussing sustainable resource systems. He posted his list for comments, which were forthcoming and not always temperate. Finally we asked everyone at the conference to rate each definition from 1 to 10. where 0 means the definition seems to apply to some other word, and 10 means a more perfect definition cannot possibly be imagined.

Few definitions received a score of 0, and only one got a single score as high as 6. Clearly there is still a lot of work to do. We list here the words we have so far identified for inclusion in the glossary. A list of the preliminary definitions developed at the second conference is Available from the secretariat.

Appropriate technology	Beauty
Carrying capacity	Energy demand
Energy ration	Energy service
Equality	Equity
Game	Human needs
Life style	Management
Model	Needs
Quality of life	Renewable energy
Renewable resource	Resilience
Resource	Resource base
Simulation	Self-reliance
Standard of Living	Stability
Sustainability	Structure
System leverage point	System
Useful energy	System response
Viability	Values

IV: PROGRESS AND PROSPECTS FOR FUNDING

The United Nations University has expressed an interest in providing funds that would support two Third World scientists, one from Latin America and one from Asia, on fellowships with the central INRIC effort for 3-12 months starting January 1984. Institutional and personnel evaluations must be filled out for the candidates before any final UNU decision can be made. To permit time for their completion, nominations for the fellowships should be forwarded to Dennis before the end of November.

UNEP has decided to provide $40,000 in support of the Balaton Group for 1983, particularly for participation of Third-World members; another $50.000/-year might possibly be awarded in 1984 and 1985, if the funds are available and we find a piece of the total project that meets the UNEP funding criteria. Of special interest to UNEP are training programs.

Dana Meadows has received a grant, from The Resource Group, a new foundation devoted to furthering a "conceptual shift... .away from seeing the world as a collection of autonomous entities, countries, or individuals, fighting for limited resources and power, and toward the realization that all individuals and nations are part of a larger, evolving whole which is the interdependent process of Life." Obviously The Resource Group and the Balaton Group have a great deal to share with each other, and we are delighted by this partnership. The grant will cover Dana's salary for a year. It will pay as well for a research assistant, some travel funds, and the costs of the computer mail system. Most of Dana's time will be spent on the textbook, but she will also work with the gaming group, especially on conceptualization of the initial model.

Chirapol Sintunawa will approach the Toyota Foundation for support of his department's activities as an associated center. Roberto Armijo will explore possibilities for UNEP funding of his institute as an associated center. Dennis Meadows will approach several foundations in the U.S. and in Switzerland (with the help of Joan Davis).

If IIASA agrees to serve as the location of the task force effort, that Institute will provide some funding for the game effort, principally by paying Dennis Meadows' salary.

There is some possibility that royalties from the game or book could be a source of funds in partial support of future phases, but we did not decide finally on whether it would be appropriate and useful to sell the game.

If design of the game could evolve in ways that contributed to satisfying the obligations the Oslo Resource Policy Group has assumed under phase 3 of their "Resource Management Project," some funds from that effort could possibly be used on the game's development (probably this would be in the form of salary and travel expenses for Hilde Jervan to work with the task force for a month or two).

The major unmet need now is for funding that will support collaborative efforts among two or more of the centers involved in our program. Responsibility for that is going to fall principally on the scientists proposing the project.

V: STATUS OF THE BALATON GROUP MAIL SYSTEM

There are now seven centers actively linked into the mail system. Another four expect soon to have access to the system. Mail user numbers have been assigned to all of these, and they are indicated on the participant list attached to this issue of the Bulletin. There have been problems caused by incompatibility with some of the European TELENET carriers, (TRT is one known compatible carrier), but the system has generally worked well. User's guides and computer user numbers are available from Tom Adler for those who wish to gain access to the system. The only requirements are access to a computer terminal of virtually any design and dial-in access to TELENET or TYMNET. These are available in most major cities in the world. Modest funding is available for grants to those centers that do not have sufficient funds for the creation of a TELENET or similar account.

We expect to switch to a new central computer, the Dartmouth VAX., in January 1984. In

the meantime, we encourage active use of the current system so that our experience will be sufficient to guide the design of any new system or improvements to the existing system.

VI: CONCLUSION

We all come back from the second annual meeting of the Balaton Group with good memories, new ideas, some apprehension about the magnitude of the tasks we have taken on, and also some frustration that, given the state of resource use in the world, we haven't taken on more. We seem to have a good balance in the group between the forces among us that advocate, on the one hand, consolidating with caution this new experimental venture and, on the other hand, pushing forward as powerfully and rapidly as possible. Both sides have made important contributions to our plan; the tension between these opposing views has kept us on track.

As a reminder to everyone, we list here some of the obligations we have assumed for ourselves. During the meeting, we agreed to:

- fulfill whatever responsibilities individuals and groups have taken on for the game and the book,
- gain access for all INRIC centers to the mail system.
- collaborate with the microcomputer group to acquire an IBM PC with appropriate software for each center, submit inspirational quotes and interesting resource management stories to The Ballaton Bulletin. (Three are due by December 1; do it today!),
- submit for the January issue of the Bulletin an official, short (i page) description of each center's activities. Remember that this next issue will be a "presentation copy," summarizing the current state of the network, suitable for all of us to use in any fundraising or publicity activities. One part of it will describe the activities of the various centers. If a new description is not submitted to the Bulletin by December 1, the one contained in this issue will be re-used.
- submit any other news or information you would like to see in the Bulletin, including revisions to the glossary,
- reserve September 9-13, 1984, for the third annual meeting. which is scheduled to take place on Lake Balaton in Csopak, Hungary,
- reserve the week, September 2-8, for a one-week teaching session on system dynamics applied to resource management and forecasting. This will be offered to about 60 people with special priority given to members of The Balaton Group and their close associates. If adequate DYNAMO facilities can be developed there, the course will be held at the TOT facility in Budapest.
- be on the lookout for interesting resource-management games that could be evaluated by members of the gaming group as they work to design the INRIC resource management game,
- promote the exchange of students and scientists among our centers, and
- don't lose sight of our ultimate objective — that each of us succeed in strengthening our collective ability to carry out research and teaching programs that lead to sustainable, high-productivity resource use in our countries or regions.
- With regard to that last obligation, the Bulletin proudly announces the awarding of the First Annual Network Entrepreneur of the Year Award to:

ENRIQUE CAMPOS-LOPEZ

Who managed during 1983 to capture the time and attention of personnel from five different INRIC centers in order to enhance both the technical capacity and the political support of his center.

A final charge to us all is one voiced strongly by Jane King at the end of the meeting. She pointed out that the management of resources based on the concept of carrying capacity is becoming an accepted idea much faster than we had expected. A number of governments are coming to her through UNESCO with serious requests for help in planning their development processes in ways that sustainably increase quality of life. And she does not see the capacity to deal with those requests, anywhere.

Here is the real challenge for INRIC — think about it now, and we will consider it as a major agenda item for our next meeting. Suppose that the demand for long-term, total-system, high-quality, and humane resource use actually does exist. Suppose that regional and national leaders were to approach INRIC and ask for guidance on programs that would permit their citizens to live within the carrying capacity of their region in a way that furthers human welfare and rebuilds the ecosystem. What can we, as individuals and as a group, offer in response to such a request? How can we meet the demand that Jane feels now and what must we do to meet an even greater demand in the future?

We have devoted many pages here to reports on the formal work and products of the Balaton meeting. We have so far said nothing about the setting, the services, and above all the people who made it possible for us to do all this work. Coming back to Budapest and to the OKGT guest house in Csopak on Lake Balaton was, for many of us, like coming home. Nearly the entire staff who made our first meeting possible was back again to take excellent care of us, drive our bus, translate both technical presentations and Hungarian jokes, prepare superb food (including special meals for vegetarians), make emergency trips for projectors, and fish us out of Lake Balaton when the wind was too much for our windsurfers. They had even added three extremely welcome new features — a washing machine, a sauna, and a volleyball court.

One never can be quite sure ahead of time where the real work of a conference will get done — in the conference room, on hikes, during a volleyball game, or over coffee or beer out on the terrace. But our hosts prepared for and supported all aspects of our conference, so that our work could proceed where ever appropriate, without concern for administrative details.

On behalf of all members of The Balaton Group, we give our great thanks, with deep affection, to our Hungarian hosts, who made it all possible.