



TO REMIND YOU OF WHO WE ARE AND WHERE WE ARE GOING ...

Here is a summary of remarks made by Dennis Meadows before the tenth anniversary symposium of the International Federation of Institutes for Advanced Study, in Trieste, Italy, September 22, 1982.

Introduction

Last week, September 11-17, 1982, thirty natural resource scientists and managers met near Lake Balaton in Hungary. We convened to evaluate the current state of the art of computer models applied to long-term, regional resource and environment analyses. The symposium was supported by UNESCO and by the Hungarian government; it led to creation of the International Network of Resource Information Centers (INRIC)¹ and to plans for a five-year collaborative research effort on factors that govern the carrying capacity and the sustainability of every region's natural resource base.

Purpose

The network is composed of centers that are already doing effective studies of resource use in their own countries or regions. We have decided to come together for mutual information exchange, educational activities, and projects involving international cooperation. There will be two main thrusts to our joint activities - scientific and educational.

- Create new knowledge about the factors that will permit sustained fertility of the resource base under conditions of high productivity.
- Strengthen capacities for total resource management in a diverse set of countries - East, West, North, and South.

¹We have two names. The Balaton Group refers to the individuals who participated in the Balaton meeting, not all of whom are affiliated with resource centers. The International Network of Resource Information Centers (INRIC) refers to the network of centers, not all of whose members attended the Balaton meeting. This newsletter is published by the Resource Policy Center, Thayer School of Engineering, Dartmouth College, Hanover, NH 03755, USA. January 2, 1983. Address inquiries about this periodical to Dennis Meadows.

The INRIC Centers

In selecting INRIC members, we required that:

- the center's personnel include world-class resource analysts;
- the center's work strongly emphasize practical solutions to important, local, resource problems;
- the center be able to demonstrate that its past work has influenced corporate or public resource management efforts; and
- the organization be reasonably assured of continuing financial support from national sources.

There are now nine centers in the network:

- Resource Policy Center, Dartmouth College, Hanover, NH, USA;
- Institute for the Systems Analysis of Arid Zones, Saltillo, Mexico;
- Center for Environmental Analysis, Gesamthochschule, Kassel, Germany ;
- Center for Petroeconomic Studies, Bergen, Norway;
- Resource Policy Group, Oslo, Norway;
- Gulbenkian Institute, Lisbon, Portugal;
- Energy Studies Unit, University of Strathclyde, Glasgow, Scotland;
- All-Union Institute for System Studies, Moscow, USSR; and
- a group composed of scientists from the Hungarian Academy of Sciences, the Hungarian Ministry of Industry, and the Department of Agricultural Economics of the Karl Marx University of Economic Sciences, Budapest, Hungary.

In addition, the United Nations University, the International Institute for Applied Systems Analysis, and UNESCO sent observers to the Hungary meeting to explore modes of collaboration with the INRIC effort.

Over the next year we expect to add centers in France, Poland, and several developing countries (Costa Rica, Venezuela, India, and Kenya are possibilities). Our long-term goal is for the INRIC groups to replicate themselves by training staff and securing political and financial support for new centers. However, the first five years will likely see our efforts restricted to about 15 centers.

Initial INRIC Activities For our first joint projects, we will:

- prepare a multilingual glossary of critical terms, such as "carrying capacity," "sustainability," "self-sufficiency," so that our work can be understood by the non-expert and also can be quantified and used in formal resource studies.
- research and write a basic textbook on the dynamics of the important, universal, resource processes - discovery, use, substitution, depletion, and regeneration. The emphasis will be on insights that apply to the behavior of natural resources when they are considered as a comprehensive, interlocking whole. The text will be accompanied by optional exercises based on microcomputer programs, so that students can personally experience simulated, long-term results of various policy interventions.
- design a computer-based game for use in a day-long exercise by senior corporate and public resource managers. This game will convey the nature of important short-term and long-term tradeoffs. It will illustrate graphically the constraints imposed on usage patterns in one part of the resource base by activities in other parts.
- conduct an empirical investigation, based on case studies in the United States, in the Third World, and in East and West Europe, of the real trade-offs (if any) between productivity and sustainability in agricultural systems.
- carry out a number of bi- and tri-lateral projects on specific resource problems of mutual interest to various INRIC centers.
- publish a quarterly newsletter. The Balaton Bulletin, that will facilitate coordination of the INRIC research and dissemination of its results.
- support travel by INRIC members to visit several Third World centers in order to discuss their participation in the network.
- organize visits by several Third World scientists to INRIC centers conducting research with which they might collaborate.
- prepare the next international meeting in Hungary, September 3-9, 1983.

Communications and training will be important goals in each of these tasks. However, each of them also implies extensive research on the nature of forces governing long-term resource quality and productivity. For example, preparation of a textbook on sustainable management of a comprehensive resource system (as opposed to only a forest, watershed, labor force, or energy system) will require concepts, models, and insights that have not yet been fully developed. It will also demand international communication and understanding, methodological development, new standards for data, and patience far beyond what is typically achieved in international interdisciplinary projects.

Dennis made the above statement in support of his request for IFIAS endorsement of the INRIC program. The IFIAS board is considering his request.

ABOUT NETWORKS

Some confusion arose at the Balaton meeting about the word "network," especially as it translates into other languages. We are a network, not an association, organization, society or federation. Why? What is a network, and what special features does a network offer in support of our research program? Social scientists in the United States have only recently begun to study networks, even though networks have always been active in most sectors of every society. The following are several descriptions of networks.

J. Lipnack and J. Stamps, Networking, Doubleday & Company, Inc., Garden City, New York, 1982, excerpted and adapted from pp. 6-9.

"Networks are spontaneously created by people to address problems and offer possibilities primarily outside of established institutions.

In contrast to bureaucracies, whose existence hinges on members who perform highly specialized tasks and who are totally dependent on one another, networks are composed of self-reliant and autonomous participants - people and organization who simultaneously function as independent 'wholes' and as interdependent 'parts.'

Unlike hierarchies, in which lower-level people (such as secretaries) have considerably less importance and power than those above them (such as managers), networks operate because of the integrated importance of all levels of structure and function. The person who types the newsletter performs as necessary a function as the person who writes it. Indeed, in a network, this is often the same person, a person who on another day may be licking stamps, answering the phone, or forming new goals.

Contrasting with the bureaucratic tendency to centralize control and decision making, in networks power and responsibility are distributed. Whereas bureaucracies seek to bring people and power into the hands of a dominant authority, networks deliberately create a decentralized pattern of power with many people accountable for the work of a network. Similarly, while bureaucracies function along vertical lines, with information flowing up and orders flowing down, networks function along horizontal lines with information and ideas passing from person to person and group to group. Within the groups constituting a network, however, traditional authority lines may well be operative. *(Dennis notes - A partial or total network may function within and be in total support of a communist, capitalist, or socialist society. Networking is totally consistent with any political or economic system. Indeed, networks are already important in raising the effectiveness of the best scientists in every one of the countries represented in the Balaton Group.)*

To see the invisible face of a network requires a really different way of looking at organizations. Instead of focusing on offices, officers, and products, look at the purposes, roles and connections. .. networkers are concerned with abstract and qualitative relationships between people. In a network, a person is always more highly valued than the papers s/he creates or files.

A network has few clear inner divisions and has indistinct borderlines. A network makes a virtue out of its characteristic fuzziness, frustrating outside observers determined to figure out where a network begins and ends.

Networkers play multiple roles, sometimes defying definition. In communicating, which is the main business of networks, a networker may in one moment serve as a node - an entry point or an end recipient - and in another moment serve as a link - a connector between nodes and conveyor of information.

While bureaucracies bind their members through mechanisms of reward and punishment (promotions and demotions), networks cohere through the shared values of their members. If a network could be drawn on paper, its lines of coherence would consist of the ideas that the participants agree upon, manifested in commitments to similar ideals."

R. Smotherman, Transforming #1, Context Publications, San Francisco, 1982, excerpted from pp. 180-181.

"I use the term 'network' to describe a group of aligned people in communication with each other.

The requirements for a network in business are the following: (1) commonality of purpose, (2) duplication of your business, (3) commitment to the success of others, and (4) open lines of communication.

In a true network there is no center, that is no individual is more important than any other individual in the network. Each person has access to those other points or individuals in the network with whom he or she has taken the time to develop a relationship. The beauty of all this is that distance is no longer an issue. Modern telecommunication has made a world-wide network not only possible, but a reality. Any individual can ... create as many points of direct contact within the network as she or he chooses."

B. Kennard, Nothing can be Done, Everything is Possible, Brick House Publishing Company, Inc., Andover, Mass., 1982, excerpted from pp. 108-117.

"(Networks) have no headquarters, no leaders, and no chains of command. They are free-form and self-organizing, composed of hundreds of autonomous, self-actualizing individuals who share a similar view and similar values - they are evanescent, ebbing and flowing around issues, ideas, and knowledge. Their chief product is information processing, pattern recognition, and

societal learning. Networks are linked by the mimeograph machine, the postal system, and the telephone. Networking cross-hatches all existing structured institutions and links diverse participants who are in metaphysical harmony. Networking is the most vital, intelligent, integrative organizational mode on our social scene...

Networks can look at things whole and obtain a clear picture of what is happening... Because career rewards do not come through networking, people are able to be honest in the give-and-take between them... Networks love truth, no matter how bad it is. Bad news is processed and transmitted as quickly and fully as good. Roll with the punches, look the facts straight in the eye, make the most of adversity: They are some of the rules of networking. There is no need of self-deception in networking. Here is one place where honesty is indeed the best policy.

Networkers are already motivated or they wouldn't be in the network. This high level of self-motivation precludes the need for any hierarchy of command. No boards or committees have to meet, no administrative orders have to be issued, no complicated legal contracts have to be agreed upon.

Networks have no paid staffs, so no seed of bureaucracy lies within them. They are formed and facilitated by unpaid generalists... Organizations have paid staffs. They are led by trained, experienced administrators or by specialists such as lawyers or scientists. Networkers tend to be generalists;

organization leaders tend to be analysts. Networks tend to argue on moral and ethical grounds, while organizations argue on legal, scientific, or economic grounds.

In order to operate, all that networks need is high-quality information transmitted through channels of trust. Participants in the network have a right to expect that data transmitted through the system are clear, reliable, timely, and confidential. This intimate, faithful level of exchange builds over time and constantly improves itself. For example, if I pass A to B in my network, in effect, I have certified to B that A is reliable and trustworthy. Should A prove not to be so, that is usually detected quickly and the network closes its doors to A the next time he comes around... I am held responsible, as well I should be, for anyone whom I introduce into the network.

Networks operate on a high measure of reciprocity; in this, they are very businesslike. Participants are not only expected to be reliable and trustworthy, they are expected to put in as much as or more than they take out. Each one is expected to possess a well-organized, up-to-date data base inside his or her head. Each is expected to contribute analysis as well as raw data. Each is expected to share generously and honestly, for among the many webs that link the network is one of shared obligation to each other."

REPORTS FROM THE BALATON GROUP

Enrique Campos-Lopez, Institute for System Studies of Arid Zones (ASZA), Saltillo, Mexico.

In support of activities by the Balaton Group, a workshop organized by ASZA will be held in Saltillo during the last week in January. The workshop will explore the possibilities of system dynamics applications for planning of arid zones natural resource management, employing the

concept of "total resources management." During the workshop Dennis and Donella Meadows and Steve Chapra will present the most important concepts of dynamic modeling, of resource management and of policy making. Officials from the State Government Planning Offices will participate, as well as those from the Ministry of Programming and Budget, the National Council for Science and Technology, technical representatives from the federal agencies related to resources, and researchers from the National Institute for Agricultural Research, which is the largest Mexican institution dedicated to agronomic research. By the end of the workshop it is hoped to have the design of an integral project in which various Mexican agencies will participate.

During the workshop the possibility of collaboration between ASZA and Texas A&M in problems of common interest to both countries will be analyzed, especially the design of a joint project which, using modeling concepts, will study the structure of the hydraulic resources shared by Mexico and the United States along the border within the Chihuahuan Desert. This is an important issue, which has never been tackled using systems tools and which could serve as an important example of joint collaboration around one of the most important resources in this arid zone.

The timing of these activities is very important for Mexico. The application of new tools and procedures for regional planning has been emphasized by the new administration of President De La Madrid and Mexico will initiate the formation of a National Planning System with a profound interest in strengthening capacity at a state level. We consider that this joint endeavor, which will begin with the workshop, is an example of an international collaboration work method.

Jane King, Population Division, UNESCO, Paris, France

You might like to inform readers of the Balaton Bulletin that, pending the availability of funds for carrying capacity studies proper, Sri Lanka (Dr. Wanigasekera at the Marga Institute, P.O. Box 601, Colombo) and Thailand (Dr. Tuntawiroon, Mahidol University, 269 Larn Luany Road, Bangkok 1) are undertaking preliminary studies which will attempt to evaluate generally the compatibility between (1) individual sectoral plans and priorities in the context of total national development, and (2) current economic planning goals and long-term prospects for sustainable development.

These studies will prepare the way for national carrying capacity assessments to be based on the methodology evolved by Malcolm Slessor.

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

Maurice has been busily corresponding on several points:

1. "I have discussed with Walther Manshard, who is, at the UNU, the Programme Director on 'Resource Policy and Management,' what the UNU could do to help the group. We agree to sponsor in 1983-84 two fellowships for individuals from developing countries who could later start two local teams within • the network. The UNU policy is to evaluate the potential of both the individuals and their institutions. We thought that

perhaps CATIE, in Costa Rica, could be one of the two institutions. The other one might be located in Asia, since there is very little capability in resource modelling in Africa for the moment."

2. I shall be looking in 1983 for an 'intern' (or research assistant), based in Paris, who could spend about 50% of his time doing research, and the rest of the time helping me in running the energy programme. That person could either be a graduate student or a young post-doctoral 'fellow.' He (or she) should have some basic training in a field related to energy problems. The stipend would have to be discussed but would be very adequate for this type of position. There would be provisions for travel and health insurance."
3. Maurice has been discussing with colleagues in France the formation of a French center to join the network. He has received an expression of interest from Michel Grenon, whom many of us know from his work at IIASA. Grenon is currently Executive Secretary of Plan Bleu, working on environmental policy for the Mediterranean region.
4. Maurice would also like the network to know of plans for the UNU's project on food-energy interactions. The project has two thrusts, one global, one local.

Three global models - SARUM, UNITAD, and UNITAR - will be used to explore the consequences of UN resolutions and policies. The sorts of policies to be investigated include: increases in South-South trade, free trade vs. self-reliance,

- efforts to attain the Lima targets,
- buffer stocks, price stabilization, cartels,
- energy price changes, and
- increased efficiency of energy use.

Results from the three models will be compared and contrasted, with emphasis on why each model produces the result it does. Principal investigators for the global side of the project are John Robinson (UNU), Kim Parker (SARUM), Jacques Rayer (UNITAD) and Sam Cole (UNITAR).

The local component of the project, directed by Ignacy Sachs, will compare integrated rural system field projects in Brazil, Africa, India, and China.

Results from both sides of the project should provide useful information to members of the Balaton Group.

Malcolm Slessor, Energy Studies Unit, University of Strathclyde, Scotland

First my congratulations on the Bulletin No. 1. I shall send a photo-copy to a couple of people who may be keen to join. It also makes excellent copy for fund raising.

PURPOSE STATEMENT. I am pleased with this and don't want to see it changed.

BOOK. My notes say that I don't do anything until drafts of all other chapters have been written and copies reach me. Therefore I have nothing to write until April and will attempt to have a text to Dana by the end of June. I shall earmark May for this purpose. Please confirm, (ed. note-please see report on the book later in this Bulletin.)

MANAGEMENT GAME. The Energy Studies Unit contribution to the first iteration of the management game will be to externalise the decision points of our world energy supply model-PIE-em, and to introduce a water sector. We know we could do much more, but time does not permit. Our system dynamicist is currently working in Denmark with the Energy Group at Riso and will not be back until early December. We need to know firm date and locus for this first meeting. I expect to be in Brazil in the second half of January and thereafter in New Zealand for three weeks. I'd personally like to be at the meeting and hence would prefer late February, if possible, but Ian Hounam, our modeller, can replace me if necessary.

SUSTAINABLE AGRICULTURE. The ESU would like to contribute to this study, being at the point of completion of a three-year study in cooperation with the Murugappa Chettiar Research Institute, Madras, India, on sustainable agriculture for a Third World rural community. The study has a large data base, MCRC personnel having spent four person-years in data collection whilst living in the community. Our systems studies have shown that a three-fold increase in solar energy capture (and hence in food and fuel) is possible through the inclusion of certain microbiological techniques, and the abandonment of certain social taboos, whilst at the same time reducing to one tenth the required input of non-renewable energy. Dr. Chris Lewis of the ESU is currently funded to write up the work under the general rubric of 'self-reliant development' and would be happy to contribute a piece to Dana for June.

This work was explored in depth at a recent international workshop held at Edzell, Scotland, in October where we were happy to welcome one of Campos-Lopez' associates, Roberto Armijo. We expect our approach to be adopted for analysis or self-reliance potential in a Nepalese and Egyptian situation, and perhaps for the Cape Verde Islands.

CARRYING CAPACITY OF KENYA. We are going to have a chance to explore our approach to carrying capacity estimation through a UN-funded study on Kenya, which we shall share with FAO, though it will be managed by Jane King of UNESCO. Though agreed in principle, the starting date has not yet been formalised.

GLOSSARY. I append below my latest thinking on the terms. The one of self-reliance, incidentally, is the one officially adopted by IFIAS.

Carrying Capacity = The number of persons in a defined territory (nation, region, etc.) for which there is an autonomous government, that can be supported at a given material standard of living indefinitely. This value may rise and fall as material aspirations rise, as new technology evolves, as infrastructure or climate changes, and as social structure evolves.

Material Standard of Living = I think it important to avoid any value judgment offering a 'norm' or standard. We can take our lead from GNP. Its numeraire is money, which successfully takes into account all upstream expenditure that has a money value. Its weakness is that expenditure

that fails to add to the real wealth is also included. In the resource area, the parallel numeraire is energy. Thus material welfare could be measured in terms of the energy usefully expended on the inhabitants of the country. Of course there are many ways of measuring this, and since most of the precise ways require a level of information barely attainable, we would have to rely on the same broad base as GNP, and go for the useful energy supplied per capita. The usual definition of useful energy is energy available in an economically useful form. One then has to quantify this as either as work or as heat. If as work, then units of heat have to be changed into units of work, using the Carnot relationship. In such a case electricity (say a kwh) would be taken as one unit of work, and heat duly modified, or, as is more usual, all computations would be as heat, with electricity quantified in terms of the useful energy entering the generating station.

Sustainability = I am not happy with Ferenc's definition, because it sets an arbitrary time horizon. To me Sustainability means just that. Nevertheless, all assertions of Sustainability do imply a time horizon, but in my view, it should not be one so long as to encompass generations-say a century or two. Personally I still like the definition I put before the group noted in Bulletin 1.

Self Reliance = IFIAS' definition is "Local initiative decided locally" (*ed. note- how might this be quantified?*)

Market self-sufficiency = A level of gross output of the system sufficient to clear the market for essential means of survival.

Need self-sufficiency = A level of gross output of the system large enough to meet the sum of the needs of the essential means of survival of all the inhabitants.

While market self-sufficiency could be computed in money units, need self-sufficiency cannot. It requires something like food calories or protein use.

Human needs = While I can express this in verbal form, it is not easy to quantify. Food calories is one expression - energy is another. It is worth noting that if energy were used, then needs, even at the survival level, depend on the nature of the economy. For example the essential food for survival in an unintensified economy requires less energy than in an intensified one.

Productivity = ? Do we need this?

Efficiency = There is always confusion between efficiency used in an economic sense and in a physical one. I would urge a physical interpretation, and hence it could be defined as;

$$\frac{\text{The work energy theoretically needed to produce a good service}}{\text{The work energy actually used}}$$

Using this definition vehicle transport is about 14% efficient, gas-fired central heating about 8% and for food = $I/(\text{energy ratio})$ where energy is expressed in work terms.

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

The following is a short description of the background and tentative content of a research project

which may set the agenda for the Resource Policy Group's work over the coming years.
Background.

In the wake of the debate in the late 1960's and early 70's over the unequal distribution of resources, and the growing population in the poorest areas of the world, an organization called "Future in Our Hands" was formed in Norway in 1974. Spreading to other Nordic countries, the organization in 1982 took the initiative for a Nordic research project to explore an alternative to the current Nordic societal model.

The Nordic social-democratic mixed economy model seemingly worked well for a long time and formed our "welfare states." But during the 70's the lustre of our model has faded away. It seems incapable of handling a lot of alarming trends. In spite of massive transfers to the health and social security systems, we have not developed into a more healthy nation, rather the opposite. "The money solution" appears to have reached its limit. Meanwhile the exploitation of nature proceeds, and the gap between rich and poor in the world widens.

A new upturn in the world economy may to some extent put a brake on unemployment growth, but it does not solve the more fundamental problem we are now facing in the welfare state.

This forms the background for the project. The clients are the five Nordic countries: Denmark, Finland, Iceland, Norway, and Sweden and the Nordic Council.

The Project.

The goal of the project is to develop an alternative societal model aimed at achieving social goals rather than the currently dominant economic growth goals. The concrete content of the work will be developed in 1983. That year will be the project's trial period, which shall result in a detailed research program starting in 1984. For this first trial period, the Norwegian Parliament will probably agree to bear the cost by itself. The proposed budget amounts to \$200,000.

The role of the Resource Policy Group.

Our group is one of two organizations which have been asked to be the secretariat for the project. We have now been told that we will get this position if the project materializes. The chances that the project will materialize are estimated to be 99%! It has already gone through one of the committees in our Parliament.

REPORTS ON THE PROJECTS

Textbook

Dana Meadows and Steve Chapra have prepared draft chapters on (respectively) human resources and water resources. Neither of us is fully satisfied yet with these chapters, but we will be able to convince each other to release them by January 10 for the comments and suggestions of our colleagues. They will be sent first to those of you who have also committed yourselves to writing chapters. After we all worry over them for awhile, the first revised versions will be sent for comment to the entire network. We have gotten off to a later start than we intended, but we

still consider it important to meet our original deadlines.

Sustainable Agriculture

Dana Meadows and a graduate student, Debra Jones, are compiling literature on alternative farming technologies in the United States. Over the spring and summer, Debra will tour several experimental and commercial farms using all combinations of organic and chemical technologies, taking photographs for a presentation to the Balaton Group next September. Dana is corresponding with Robert Rodale of Organic Gardening magazine in order to compile a list of study farms.

Mail System

The quotes above make very clear the central importance of communication channels to the operation of a network. The Balaton Group channels are not working very well at the moment, and we must make their improvement a matter of urgent concern. Let me cite a few examples of the problems and then propose a solution.

We have heard nothing at all from anyone in Hungary, the USSR, or Poland since the September meeting. Victor was intending to visit France and Germany this past fall on a UNESCO fellowship, but Jane has just informed me that he is now not due until April or May. Enrique wrote to invite Dana and me to participate in a Mexican meeting. It took four weeks for his letter to arrive, and I can't respond quickly because his telex number does not work. Letters have frequently taken three months to go between Hanover, NH and Budapest. Malcolm is about to head off for Brasil and New Zealand for more than a month, and it would be exceedingly costly to track him down during that period. I have to change the preliminary proposals for a game meeting in Europe in January, but I am not sure I can contact everyone in time. Jane dictated a letter to me but it got delayed for a month when her secretary became ill. Probably I will make a trip to Europe in February, but I will not know the dates until it is too late to correspond with the Balaton members who would like to meet with me.

All in all, it is amazing how effectively we are managing to pursue a set of common goals. But it is time to develop some better system.

At the Balaton meeting we discussed the use of micro computers for an electronic mail system. The selection and acquisition of the machines is still many months off, but we can have the mail system without them.

I have opened up 15 accounts on the Dartmouth College computer time-sharing system. Each of these has been assigned to one of the Balaton Group members along with a private password. The account can be used for any computing purposes, such as running DYNAMO models, but it will principally be useful to us as the basis for an electronic mail system.

Dartmouth's computer system is linked to TELENET which is accessible in most countries. East European countries can connect with TELENET through IIASA, if they cannot do it directly. Under separate cover we are sending each of you a package of information that indicates the assignment of all account numbers and tells you your private password. It describes the use of

the Dartmouth "MAIL" system and spells out procedures for connecting with TELENET.

We will pay all costs of the central computer system. Each member of the electronic mail system must only secure a TELENET account in their own country and arrange for payments to cover setup, monthly account charges, the costs for each hour of time spent actually using the system, and the fees for data transmission. The typical charge would be about \$20 as a one-time fee to establish the account, \$10/month fixed charges irrespective of use, \$10 for each hour you are actually connected to TELENET, and \$1 for each page of information transmitted. I expect most members will be able to pay these costs from their institute's general budget. If that is impossible, I have enough money so that everyone can try out the system for three months. With this system, it should be possible for most people to stay in touch with the network on a weekly basis even when they are in countries other than their home. They will simply have to use a local telenet number. A Washington DC friend of mine maintains an electronic mail system with me. Recently he spent two weeks in Australia, and he had no difficulty using his account from there.

REPORTS ON FUNDING

It is still a bit early to have accumulated much new money in support of the Balaton Group's projects, but there is progress to report. The UN Secretariat has approved in principle a major proposal in support of Jane's and Malcolm's carrying capacity study. This would involve Enrique as a collaborator. The money must still be found, but that looks promising. Another UN agency is considering our request for \$60,000 of funds to support search for new Balaton members in the Third World and to cover many costs of coordinating the network. A final decision is due in March. Maurice has obtained funds from the United Nations University to support two fellowships and a little travel in connection with participation of Third World institutes in the Group. Enrique and Steve are discussing a major initiative that would provide Mexican and U.S. government funding for a binational study of the Colorado River Basin and Jessica has held preliminary discussions with Steve about funding some work at Texas ASM.

Let me know of other initiatives. It may often be possible for one of the Balaton Group members to provide technical or political support for some funding search you are engaged in.

Management Game

At Dartmouth we have surveyed the literature on 'gaming' to see what other examples might be relevant to our project. We have secured a \$20,000 grant from the U.S. Forest Service to finance part of our work. They want a forest simulation that can be used by the senior managers in the Forest Service to identify long-term issues. Paul Faeth will be working on this, but his efforts only start in January.

I have not heard from the Soviets, and Malcolm has been held back so far by lack of funding. I have submitted a request to UNESCO for their support of an international seminar on gaming that we could use at the end of our first phase. It will be some months before a decision is made on that. The meeting we had proposed for late January has been postponed.

PUBLICATIONS FROM THE BALATON GROUP

This section will be used to inform everyone in the network when one of us has released a new book, journal article, or technical report. You can assume, unless it is explicitly stated otherwise, that the items listed under this heading can be obtained from the author upon payment of the printing and mail charges.

Campos Lopez, Enrique and Robert J. Anderson (Eds), Natural Resources and Development in Arid and Semiarid Regions, Westview Press, 5500 Central Avenue, Boulder, Colorado 80301, USA. \$26.00 pays for the book and for mailing. This book, to be available in spring 1983, resulted from an international conference held by the Applied Chemistry Research Center (CIQA) [This is Enrique's institute] and IIASA. It integrates various perspectives on the evaluation of natural resources in arid and semiarid zones, analyzes development options, and discusses systems analysis tools that could be important for the management of technology. Twenty-five papers are grouped into six sections:

Introduction, The Semiarid Regions of the World, Resource Assessment - Methods and Results, Development Options, Methods for Appraising Development Options, Conclusions.

MEMBERSHIP CRITERIA

Soon we will have to deal with one symptom of our success. Even though we have not yet completed any joint projects, many people have already heard of the Balaton Group. I have personally received letters from half a dozen scientists asking for more information on our program and requesting my opinion on the possibility of their becoming affiliated with the network. Of course we are eager for our program goals to take root in other good institutes. And it is important to add some Third World countries to the group, so that we might benefit from their perspectives. However, I greatly respect the importance of personal friendship and trust in the operation of a scientific network. That rapidly disappears if we admit people not generally known to the group. I have passed on copies of the Bulletin to most inquiries and said that no new members will be accepted until all those in the Balaton Group have expressed their opinion on the mechanisms and criteria for accepting new members. Probably this will have to be one of our major agenda items next fall.