

THE BALATON BULLETIN # 17
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INRIC BUSINESS

There will be an interim Steering Committee meeting April 23-24 at Joan Davis's house in Toessriederen near the airport in Zurich, Switzerland. All interested INRIC members are invited to attend. Steering Committee members will have their expenses paid to attend, if that is necessary. Items of discussion will be funding for the network, topic and arrangements for the annual meeting in September, and any other administrative matters that need to be settled for INRIC before next September. Please inform Joan if you plan to come, so she can plan accommodations for us all. (Joan Davis, CH-8193 Toessriederen 57, Switzerland, telephone 41-1-867-1970)

THE SOVIET RIVERS PROJECT: THE SOCIAL IMPACT OF LARGE-SCALE ACTIVITIES IN NATURE MANAGEMENT

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The origins of the term "conquering nature" can hardly be traced now. To make nature obey man's will seems to have been a dream for many years, the triumph of human reasoning, the evidence of prosperity. Nature was to be conquered, not to be lived with in a skillful, delicate, reasonable co-existence. It is only during the last decade that the intelligent use of nature, rather than conquering it, has entered our agenda.

Raising production forces the need for more and more of the depleting natural resources such as fertile soils and fresh water. Expanding production also results in adverse effects on nature -- pollution of water bodies, atmospheric contamination, soil salinization, etc. Water is at the center as both necessary for production and also a receiver of the wastes of production. It is not surprising, therefore, that water is one of the main aspects of nature that mankind wishes to conquer, and that water management projects receive much attention and publicity.

Any water management project modifies local natural conditions. The consequences of this are difficult to forecast and often irreversible: forests are destroyed, rivers and lakes dry out, the inhabitants of those forests and lakes become extinct, and this means our common home is being destroyed. The greater a project's scale, the greater may be the catastrophic consequences of its implementation. And the irreversibility of water projects poses special economic, ecological, and social requirements for them.

We want to emphasize the negative consequences of these projects not so much for nature but for human beings. We speak much about the need of conserving nature, omitting to say that this must be a nature in which people can exist. In our opinion the awareness of this fact may have paramount significance in molding public opinion on natural resource management.

"The project of the century" in our country was that of turning part of the northern and Siberian river flows to the southern regions of the country. This project has been much discussed in our mass media and elsewhere. Here are some figures to illustrate its impressive scale: a 200 m wide 2400 km long canal was to be dug, with an altitude difference amounting to 110 m, for the transfer of 27 cubic kilometers from Siberia to the Aral Sea.

Let us analyze the experience of molding and utilizing public opinion in the discussion of this project - which at present is valued more highly than the originality and rationality of the underlying design solutions. For the first time the general public opposed the project in 1985, during the nation-wide discussion of the draft of the "Guidelines for Economic and Social Development of the USSR 1986-1990 and for the period until the year 2000," which envisaged starting construction work on the project. The newspapers were full of protests. Doctors warned about the sanitary-epidemiological implications, biologists stated that the flora and fauna of several river basins could be damaged, geologists argued that the canal routes were laid out in soils unsuitable for the purpose, historians were apprehensive of the threat to monuments of history and culture; agronomists, economists, prominent scientists also put forth arguments against the project.

As a result the item in the "Guidelines" draft was revised after the CPSU Congress; the revision called for in-depth study of the problem.

The project proponents interpreted the decision of the Congress in their favor and suggested transferring several cubic kilometers to the Volga River as an experiment. This stirred public opinion once again. Writers were particularly active in the campaign, attracting the broad public to discussion of this crucial issue.

Public opinion was also aroused by the ad hoc Commission of experts in sciences and technology, which was to study ways of enhancing land reclamation efficiency. The Commission invited the assistance and advice not only of prominent experts, but also of research institutions and non-profit societies.

Following the advice of the Commission, the Presidium of the USSR Council of Ministers jointly with the Political Bureau of the CPSU Central Committee adopted a resolution which read: "Having analyzed the design and development works involved in the transfer of the northern and Siberian rivers to the southern regions of the country, the Political Bureau, in view of the need to study the ecological and economic aspects of the problem as suggested also by the broad public, decided it reasonable to discontinue all the project activities." The resolution adopted by the CPSU Central Committee and the USSR Council of Ministers envisages concentrating effort and material resources primarily on a more thrifty and efficient utilization of the available water resources and comprehensive use of all factors of agriculture intensification.

The very fact of taking into account the opinion of the broad public in the Resolution is proof of the decisive role public opinion played in this matter.

The experience we have had with the "project of the century" shows, on the one hand, that nation-wide discussion of such projects should start at the earliest possible stage, since an integral picture of all possible impacts, especially social impacts, cannot emerge unless broad masses of the people are involved in the dispute. On the other hand, this public participation is a major benefit of such large-scale projects.

DESIGNING FOR RESILIENCE

This excerpt from *Brittle Power* by Amory and Hunter Lovins (Brick House Publishing Company, 1982, page 213) sheds some useful light on the resilience of modern energy systems, food systems, industrial systems, cities, organizations -- any systems.

A resilient system is made of relatively small modules, dispersed in space, each having a low cost of failure.

Failed components can be detected and isolated early.

Modules are richly interconnected so that failed nodes or links can be bypassed and heavy dependence on particular nodes or links is avoided.

Links are as short as possible (consistent with the dispersion of the modules) so as to minimize their exposure to hazard.

Numerically or functionally redundant modules can substitute for failed ones, and modules isolated by failed links can continue to work autonomously until reconnected.

Components are diverse (to combat common-mode and common-cause failures), but compatible with each other and with varying working conditions.

Components are organized in a hierarchy so that each successive level of function is little affected by failures or substitutions among components at lower levels.

Buffer storage makes failures occur gradually rather than abruptly: components are coupled loosely in time, not tightly.

Components are simple, understandable, maintainable, reproducible, capable of rapid evolution, and socially compatible.

RESOURCE INDICATORS: A SHORT REPORT FROM MARK HANSON

At the 1986 Balaton meeting, a working group came up with a preliminary set of indicators of sustainability for a region or a nation. Mark Hanson sends this report on his attempt to find data on these indicators for Wisconsin (and in some cases the U.S.).

1. desertified area 1986/desertified area 1970.
no area desertified in Wisconsin -- though that conclusion depends on the definition of desertification.
2. species lost per year/total # of species in 1970.
no species were lost, to anyone's knowledge.

- | | |
|--|---|
| <p>3. <u>mean annual ground level CO concentration</u>
for Milwaukee the worst 8-hour observation was 5.5 ppm. Mean level not available.</p> <p>4. <u>% of total energy use derived from nonrenewable sources.</u>
96%</p> <p>5. <u>energy efficiency of the national fuel provision system (commercial energy out/commercial energy in)</u>
75% for Wisconsin, using the ratio of end use/resource</p> <p>6. <u>energy imports/total imports</u>
25% for the U.S. in 1982</p> <p>7. <u>natural area per capita</u>
3.1 acres of forest per capita</p> <p>8. <u>% agricultural self-sufficiency in monetary units</u>
(net exporter)</p> <p>9. <u>% of cultivated area with mean annual soil loss per hectare of less than 10 tons, 10-20 tons, 20-40 tons, over 40 tons.</u>
information available but must be calculated from a map</p> <p>10. <u>cultivable land per capita</u>
3.9 acres</p> | <p>11. <u>ratio of recycled materials to virgin materials</u>
?</p> <p>12. <u>infant mortality</u>
10.3 per 1000 live births</p> <p>13. <u>fertility</u>
15.7 per 1000 population</p> <p>14. <u>% population with access to sufficient safe drinking water</u>
100%, although some are using bottled water because of hazardous groundwater from agricultural chemicals</p> <p>15. <u>protein consumption per capita</u>
?</p> <p>16. <u>ratio of annual international debt payment/total exports</u>
?</p> <p>17. <u>ratio of military expenditures/education expenditures</u>
1985 U.S. military expenditure \$1143 per capita
1982 Wisconsin public education \$789 per capita</p> <p>18. <u>average grade of newly discovered ores/average grade mined in 1970.</u>
?</p> |
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SOCIAL INDICATORS: THE WORLD BANK'S VERSION

Laszlo Lovei sends us the list of social indicators, included as pages 6-7, which is now used regularly by the World Bank (which may mean that data are available from the Bank for all these indicators for any country with which the Bank deals). Laszlo says that any proposal for a project from the staff to the Executive Directors must be accompanied by these indicators, to give an idea of actual living conditions in the country. Notice the absence of resource and environment indicators -- but that may change. The Bank has been hiring a number of ecologists and environmental experts and is now taking seriously the assessment of the environmental impacts of its projects.

UPDATE ON INRIC'S EDUCATIONAL GAMES

STRATEGEM-1 is now available in a professionally manufactured kit that contains four complete game sets together with overhead slides and a video cassette for introducing the game. The boards are in color, mounted on folding cardboard bases, and the capital pieces each bear a number indicating their value. One thousand sets were manufactured in Canada with the majority going for use by the Ontario school system. However, Dennis has some of these kits for distribution at cost to members of the Balaton Group.

FISH BANKS, Ltd. is now available as a polished set with color boards on plastic cloth and custom manufactured boats and money. These kits are also available from the INRIC secretariat.

NEWS FROM THE MEMBERS

Wim Hafkamp ran in "a spectacular half-marathon (13+ miles, about 20 km) through dunes and over beach north of Amsterdam." His time was 1 hour 24 minutes. Watch out for him in the morning runs at the next Balaton meeting!

Jaswant Krishnayya, Anupam Saraph, and other members of the Systems Research Institute are organizing a workshop on Sustainable Futures Modeling to be held April 4-9, 1988, in Singapore. Among the speakers at the workshop will be Balaton Group members Malcolm Slesser, Jerry Barney, Dana Meadows, and Jaswant himself. If you are interested in more details, contact Jaswant or Anupam (Systems Research Institute, 17-A Gultekdi, Pune-411037, India).

Jaswant's Christmas letter features a beautiful picture of two-year-old Alisha-Helen Krishnayya, who is, in the words of an impartial observer, "both sweet-natured and tremendously responsive. Alisha has inherited a pretty good ear from her mother, it appears, and demonstrates it by picking up small and big words fast -- in English, Hindi and Marathi."

The letter continues with a description of the current activities of SRI: "SRI is in its 14th year and about to move from doing applied research to developing post-graduate teaching programmes in computer-based simulation modelling, Systems Analysis, Informatics and computer cartography. 1988 should be a crucial year for SRI, since the computer cartography group must find a new sponsor for its work, and another major project on spreading modelling knowhow in developing countries comes to an end in January 1989. In this five-year effort, with the support of the IDRC of Canada, SRI built up a big collection of documents and generated publications and workshops for participants from as far away as China. Five workshops are scheduled for the year."

Professor Dmitri Kavtaradze, Head of Moscow State University's Laboratory for Ecology and Protection of Nature has arrived at Dartmouth College for nine months to work with Dennis Meadows on the Dartmouth-Moscow State exchange program on environmental education. Dmitri is a specialist in design and use of simulation games that illustrate ecological principles. He has already translated two of INRIC's teaching games into Russian and organized workshops for teachers on their use. He will collaborate with other INRIC members upon his return next fall to organize and conduct a session of the INRIC seminar on Principles of Sustainable, High-productivity Resource Management for thirty of the most influential environmental teachers of the

USSR. Dmitri is living at the Meadows farm where he has already demonstrated that his skills in environmental resource management are not only theoretical.

Dana Meadows recently spent a week in Washington at a symposium celebrating the 100th anniversary of the National Geographic Society. The symposium was entitled "Earth '88: Changing Geographic Perspectives." It surveyed the past 100 years and looked into the next 100 years concerning such topics as energy, transportation, communication, and technology. Speakers included Paul Ehrlich on population, M.S. Swaminathan on agriculture, Mohamed Kassas on desertification, Peter Raven on tropical forests, E.O. Wilson on biodiversity, Gilbert White on water, James "Gus" Speth on pollution -- and Dana Meadows on Quality of Life. The Geographic Society will be publishing a book containing all the presentations, to be released at the end of this year.

Victor Gelovani has been elected as a candidate member within the computer division of the USSR Academy of Sciences. This is a very great honor especially for someone so young. Victor continues his work to help organize the World Laboratory, an international research institute that will be based in Moscow to offer scientists from many nations the opportunity to work together on solutions for global issues.

Amory and Hunter Lovins are working with Victor Gelovani to organize children's camps in the the Georgian Republic of the USSR and in the US State of Colorado. These summer sessions will bring together children of many nations to study computers and other tools for improving society.

Dennis Meadows will receive a Fulbright Fellowship to finance his work with INRIC members in the Soviet Union next fall. While he is in Moscow he will lead an international team in a project that is financed by major grant from the United Nations Environmental Programme. This project will develop in the USSR a center where the INRIC resource management workshop can be offered to Third World officials on a continuing basis. Dennis is now looking for INRIC members who would like to come to Moscow for two weeks or more in the period September 24-November 30 to assist in the project.

Bert de Vries writes, "There are rather good prospects for the joint IVEM-SRI project on extending the Future Voltage planning game into a planning tool for Indian utilities. It has been demonstrated at the Ministry of Foreign Affairs in The Hague - and will be demonstrated for the National Thermal Power Corporation in Delhi." Now Bert proposes to visit India for two weeks to implement his energy planning game with Indian authorities and to visit other institutes that are potential INRIC members.

Niels Meyer worked with Bert, Jorgen Norgard, Hartmut Bossel, Thomas Johansson, and Bent Sorensen to conduct a workshop in Kassel on January 28-30. A working plan was developed for the INRIC project on Non-Nuclear and Non-Fossil Sustainable Energy Futures for Europe. Now major funding requests have been sent out to secure the necessary financing.

Antonio Camara reports, "1987 was a great year for our Group and Portugal, in general. We are in charge of huge studies for the Secretary of State of the Environment (Tagus Estuary, National System for Environmental Control). The General Director of Natural Resources recently invited us to run a short course, for people in his Directorat, inspired by the INRIC workshop he attended at Gulbenkian Foundation in 1986." From Antonio INRIC members may obtain an eight-page annual

report naming the 20 members of Antonio's group, listing 14 recently-completed and on-going projects, and referencing 23 reports prepared in 1987.

The bad news is that Betty Miller will miss the September Balaton Group meeting; the good news is that she will be staying at home then attending to her new baby, who is expected to arrive just at that time.

STORIES, QUOTES, AND JOKES

"When a horse stops working and goes into the barn there is a life and a vitality left, there is a breathing and a warmth, and the feet shift on the straw, and the jaws champ on the hay, and the ears and the eyes are alive....But when the motor of a tractor stops, it is as dead as the ore it came from. The heat goes out of it like the living heat that leaves a corpse. Then the corrugated iron doors are closed and the tractor man drives home to town, perhaps twenty miles away, and he need not come back for weeks or months, for the tractor is dead. And this is easy and efficient. So easy that the wonder goes out of work, so efficient that the wonder goes out of land and the working of it, and with the wonder the deep understanding and the relation. And in the tractor man there grows the contempt that comes only to a stranger who has little understanding and no relation. For nitrates are not the land, nor phosphates; and the length of fibre in the cotton is not the land. Carbon is not a man, nor salt nor water nor calcium. He is all these, but he is much more, much more; and the land is so much more than its analysis. The man who is more than his chemistry, walking on the earth, turning his plough-point for a stone, dropping his handles to slide over an outcropping, kneeling in the earth to eat his lunch; that man who is more than his elements knows the land that is more than its analysis. But the machine man driving a dead tractor on land he does not know and love, understands only chemistry; and he is contemptuous of the land and of himself. When the corrugated iron doors are shut, he goes home and his home is not the land."

John Steinbeck, Grapes of Wrath

"In contemporary art primitive form is a spiritual need; an adherence, as it were, to humanity, the earth, the past. It is a longed-for escape from the frigid beauty of technical perfection. With the passage of time, we have lost our sense of contact with the earth: the aeroplane, the radio and the implication of what is yet to come have made us realize at what speed we leave nature behind us; however, the new, primitive form, still fashioned by the human brain with human love, will prevent the final death of the soul."

Endre Farkas, 1929
(quotation discovered by Bert de Vries
in a book about the Hungarian artist
Margit Kovacs)

Protein Production from Post-Harvest Paddy (a good-news story from Chirapol Sintunawa)

Each year farmers in Thailand lose substantial amounts of their product in paddy fields during harvesting, threshing, and transport. An average of 163 kilograms of paddy is lost from every cultivated hectare during the harvest. The total loss of paddy for the whole country is estimated to be as high as 1.17 million tons each year, which is equivalent to .7 million tons of white rice, or \$135 million U.S. dollars worth of export value.

In many parts of the country farmers collect the fallen paddy in their fields by hand. A maximum of 135 kilograms of paddy can be collected in this way from each hectare, and the number of farmers collecting this post-harvest paddy is only a small fraction of Thai farmers.

One activity that has become widely accepted in many parts of the country is the conversion of unrecoverable post-harvest paddy into protein through duck raising. Farmers are currently using an area of 160 hectares of paddy field to raise 4000 ducks from the age of four days to an average weight of 2.3 kilograms in 76 days. The ducks are mature before the next growing season begins. An average of 9 tons of duck gross weight is produced on 160 hectares, or 57.5 kilograms per hectare (25 kilograms of protein).

Duck raising in paddy fields requires some additional feed, but the total required drops to only two-thirds of the amount normally required. If farmers could use up to 50 percent of the total area in paddy, almost \$70 million worth of paddy could be converted to a considerable amount of animal protein for domestic consumption. This could significantly reduce hunger in many areas.