



# Remarks on the Water Project

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REMARKS ON THE WATER PROJECT

M. Fiering

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## MEMORANDUM

To: Professors Rozanov, Haefele and Raiffa Date: 25 March 1974

From: M. Fiering

Subject: Remarks on Water Project

1. I am encouraged that Dr. Rozanov has agreed to provide active leadership for the Water Project, and this appointment has my full support and cooperation. I welcome his suggestion for periodic meetings and conferences, and hope that they will lead to a clearly identified product.
2. Given what we have learned these past few months, I think it appropriate to discuss options concerning the directions we might take, and therefore I propose that the Water Project staff meet immediately to prepare a position paper which would be amended by Belyaev and Koryavov when they return, and then be transmitted to Haefele and Raiffa, with a request for a full meeting.
3. I propose further that we now schedule a small meeting for the late summer or early fall in order to collect advice from new participants in the Project, a few outside experts and any other likely sources of support. I anticipate we will have less to show for our year of effort than other Projects, and that the fall meeting of the Council will be critical of our progress. I therefore think it very important to consolidate our efforts, to focus on sharply defined goals and to invite a few (not a full representation from every NMO) guests to help formulate new ideas and consolidate old ones. I suggest early fall or late summer because it would be late enough to incorporate our new arrivals but early enough to be helpful to the Director in preparing for the Council. One additional reason, frankly, is that I would hope to attend and would want no interference with my academic calendar.
4. The outside experts might be constituted as a formal Panel to visit the Water Resources Project; its organization and function could be similar to that of Visiting Committees which serve many universities and research institutions. In this sense the Visiting Panel would provide a continuing

constructive review of the project work at IIASA, and long-term overlapping appointments would guarantee continuity of this function. It could pass on the details of scientific work where the Council as a whole cannot, and would help the Project by pointing out significant trends and needs and in the area, related work, and literature relevant to the enterprise. It would thereby help the Director in defining the need for new appointees. I submit that such a Panel might ultimately be constituted for each Project, and that perhaps 4 or 5 persons be asked to serve. It would be useful if some members were appointments to more than one Panel.

5. Let me add a few thoughts on what the Water Project might profitably consider for the remainder of this year. Our experience at IIASA suggests that major case studies, retrospective or not, are best undertaken by the governments or agencies centrally interested. For example, Prof. Kaczmarak wants our help in studying advances for the Vistula, but insists that the main thrust of the work be carried on in Poland. Given what we have learned about the manpower requirements for these major model studies, it seems inappropriate that we accept the necessary computer hassle and data collection problems.

It would also be unwise, I think, to pursue small problems or pieces of problems; the cumulative result would not be impressive.

It also seems unreasonable to try to develop a "model of models," or a general water-resource model. Long personal experience in this area has led me to conclude that the traditional systems approach, dividing major projects into a series of coupled sub-systems, does not work for water models. Enormous effort has been poured into this concept, virtually all without benefit; the literature is cluttered with the corpses of these vain attempts. This means it is not realistic to collect a data bank of economic benefit functions for many potential uses, in the hope that some model user might need them a few years hence.

I feel we can profitably concentrate in two areas. One concerns the global considerations which we discussed much earlier in the year: is there really a water shortage? Will there be one soon? If so, is it based on quality or quantity considerations? When and where will it be critical? How can water be used as an instrument of policy with respect to energy generation, human settlement, etc.?

The second question concerns the use of existing water systems for purposes other than those for which they were intended. Most large systems incorporate upland reservoirs which service demands for consumptive withdrawals in upstream reaches and which exert modest control on reaches below. Haefele's work suggests the need for additional low-flow

augmentation to serve the consumptive needs of wet cooling towers for energy generation, and we know that the lead time for construction of major storage and control work is of the order of decades. This implies that pressing energy needs will impose demands long before we can build water systems to service them, and it will become necessary to operate existing systems to meet these demands, along with upstream requirements in a systematic and disciplined way. Thus innovative operating policies, trans-basin diversions, etc., become essential factors in water-resource configurations. There has been intensive effort here, but little imaginative use of control theory, coupled with modern analysis of water quality standards. I think we should concentrate in this area; the connections and opportunities with the Energy, Ecology and Urban Projects are obvious, and should be encouraged.

One important result of all this collaboration is that a rational plan for plant siting might evolve. This is an area which is central to the concerns of almost all projects, and I am assured by Haefele that the Energy Project views this as among the most important questions with which IIASA could deal. I strongly urge that we pursue it.

Mike

## MEMORANDUM

To: Professor Raiffa

Date: 19 April 1974

From: M. Fiering

Subject: Involvement of the Water Project and  
Other Miscellaneous Items

1. As you requested the other day, I submit this brief summary of the several areas and outside projects which now seem to be drifting toward the water project and which give it some promise of becoming a strong force in water-resource development. Our oldest involvement is that with the Tisza River. I have not spoken with Belyaev and Koryavov since their return from the United States so I do not know the exact status of the network flow model which has been proposed, but it seems reasonable that their other commitments made it impossible for them to make much progress. The extent of our cooperation has never been adequately defined because it depends in a large measure on how rapidly the simple model is replaced by other more sophisticated versions. This is a function of how forcefully the Hungarians press us, and generally speaking I do not envision this as a major consulting or research effort for us.

Second, we are, or soon will be, intimately involved in the Vistula River program. The extent of our collaboration here will be to provide a high-level methodological study of some of the statistical and hydraulic issues which will then be incorporated in the detailed simulation program being prepared by the pools.

Third, as I described in the report of my trip to Italy, we have a wonderful opportunity to initiate a formal training session in regional and inter-regional decision making on the conditions of conflict. The Italians are prepared to pay for this service, to staff it, and to help us generalize its results to international ventures such as the Tisza or others. The issues here will be adequately to define the political and institutional mechanisms whereby side payments can be effectuated.

This is part of the political part of making trade-offs and depends to some extent on nuances of presentation, modes of output, and other subtleties.

Fourth, the Rector of the new University in Catania has asked me to enquire about the availability of assistants from IIASA with respect to establishing a systems program in his new faculty. Whether we respond as individuals or as an Institution, this represents a level of enquiry which had not earlier occurred to me.

Fifth, Professor von der Emde and his colleagues from the Technische Hochschule in Vienna approached me to solicit our assistance in connection with the study of the Leiter River south of Vienna. More substantially documentation on this proposal has presumably reached you by now, and we will have to make some policy decision with respect to an official letter of enquiry which will be forthcoming from the Technische Hochschule.

Sixth, you have probably learned that Wolf Haefele, Harry Swain and I have been discussing a cooperative venture with respect to studying the siting of power plants in Germany. This involves management of water resources for water quality control, and represents another area of outside contact through the Water Resources Project.

All in all, we seem to have quite a rich bag of consulting services and projects which should occupy the Project staff for quite some while. It is a good feeling.

2. I want to confirm the list of names which we discussed the other night; Gilbert White, Harvy Brooks, George, Carrier and Walter Rosendlith. In addition, I want to remind you to contact Dr. Robert White, Administrator of NOAA, US Department of Commerce, Washington DC. Please use my name.

*Mike*