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IIASA AND THE POLICY MAKER: INTEGRATING THE RESEARCH FUNCTION INTO DECISION MAKING

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PREFACE

As stated in its charter, IIASA "shall initiate and support collaborative and individual research in relation to problems of modern societies arising from scientific and technological development". According to the aspirations of the founders of IIASA and the National Member Organizations (NMO), it is not sufficient, even though necessary, for IIASA to strive for the highest professional standards. IIASA is expected to focus on real problems of interest to our NMOs and to be in regular contact with decision and policy makers in order to get a better understanding about the problems faced by them and to try to provide them with guidance or help for decision making. If IIASA were to be enclosed in the ivory tower of theoretical research, as attractive as this may be for the individual scientist would not fulfill those expectations.

Therefore, for IIASA the question if its research program is "applied" enough, if it does meet the needs of its NMOs, is of vital importance just as the problem of communicating its results to the right audience, in particular the potential users, the decision and policy makers.

In an attempt to be better prepared to meet the expectations of its NMOs, IIASA has intensified its interactions with policy or decision makers. John A. Busterud, former Chairman of the Council on Environmental Quality, U.S.A., was invited to IIASA and took part in many IIASA activities. He discussed with the Institute's scientists and management the problem of integrating the research function into decision making. This invited paper about "IIASA and the Policy Makers" deals with a subject essential to all of IIASA's work and merits further thought and discussion inside and outside IIASA.

SUMMARY

There exists a growing gap between the scientist and the policy maker largely resulting from the increasing complexity of world problems. At the same time scientists have tended to compartmentalize their individual disciplines. This paper appraises the role of IIASA in meeting the needs of policy makers in the atmosphere of this apparent communication gap.

IIASA has launched a systematic attack on world problems and promises to become increasingly effective in the future. Its strengths include its international non-governmental base, its membership representing widely differing political systems, its relative freedom from politicization, and its ability to achieve cross-fertilization in scientific research.

However, IIASA's reliance on systems analysis and complex scientific concepts tends to isolate it from policy-makers and the public, and make the problem of communication a serious one. IIASA, too, should increasingly deal with real world problems, and communications must be open from the policymaker to the Institute if it is to learn what those problems are.

In order to bridge this gap IIASA might undertake expansion of its guest scholar program, develop better techniques for determining research needs, encourage national training programs in systems analysis to familiarize leaders with IIASA's potential, and develop new forms of audio-visual presentations for use with policymakers.

In considering IIASA's future work program, additional emphasis should be placed on strategic problems of resource shortage and allocation, climatic effects, risk assessment and oceans (including Law of the Sea). In the area of economics, work should go forward in systems analysis of environmental, energy, resources and growth problems. IIASA should also increasingly concern itself with pollution, particularly in modeling environmental trends, health effects of energy use, effects of proposed air and water quality standards and the role of non-point pollution sources.

Additional work in decision analysis and conflict resolution would be useful, with emphasis upon client-related problems and multi-party conflict situations.

IIASA has developed into an effective organization, but one which must increasingly deal with problem-oriented research and relate more closely to the needs of policy-makers. The ultimate test of its effectiveness will lie in its ability to move in these directions.

BACKGROUND

To the policy-maker and his principal advisers, the world of research and of systems analysis often seems remote and forbidding. Historically there has been a gap, not only in knowledge but in understanding, between the scientist and the man of affairs. While political leaders must increasingly rely on scientific information if they are to be successful in dealing with difficult and complex modern day problems, they turn to the scientist for assistance reluctantly and feel uncomfortable in the ensuing relationship. The natural division of labor between scientists, on the one hand, and political leadership, on the other, continues to separate these two groups and to render each suspicious and wary of the other.

Unfortunately, as scientific advances have increased their pace exponentially scientists have tended to develop highly specialized compartments for themselves within their disciplines, and made understanding of entire systems more difficult for science itself, not to mention for those who view scientific problems from the position of lay-men and policy-makers. Thus, while our highly specialized and technological society depends for its viability upon the ability of its constitutent parts to communicate effectively, there has been a growing lack of understanding and credibility between one scientist and another, and between the scientist and lay-man. (1)

My task is to appraise the role of IIASA in meeting the needs of the world's policy-makers, and to suggest new approaches and research roles. In doing so, these realities I have mentioned must be borne in mind, for, no matter how innovative, resourceful and useful IIASA's programs may be, they will succeed only to the extent they are effectively communicated to policy-makers.

IIASA' Unique Role

Viewed in this perspective, much of IIASA's usefulness lies in its ability to bridge the gaps between scientific research in individual countries and establish better lines of cross-disciplinary communication between scientists throughout the world. Its existence has made possible a more comprehensive and systematic attack on major world problems, so that its overall contribution to world progress has been greater than the sum of its component parts. Thus IIASA, despite its brief existence, has played a valuable role in applying systems analysis to a growing list of human problems. It promises to have even greater influence as its membership expands and it becomes increasingly involved in dealing with important real world policy questions.

IIASA is unique in a number of ways which give it special value in approaching complex societal issues:

- Its carefully-nurtured non-governmental base renders it immune from many of the bureaucratic and polemical tendencies that have limited intergovernmental cooperation, both directly between nations and in international intergovernmental organizations.

- IIASA draws support and participation from diverse political and social systems, but nevertheless from countries that share many of the same pressing world problems. Thus, it can draw valuable lessons from differing approaches and experience in solving what are really common problems.
- The organization has been free of politicization and thus has been able to maintain a truly free and scientific work atmosphere. Its location in Laxenburg and in Austria, a neutral country, is fortuitous.
- As an international organization IIASA has made it possible to integrate scientific research efforts and to apply a global approach to environmental and other world problems that are, themselves, global or universal in nature.
- IIASA provides a valuable cross-fertilization for national scientific research efforts and has often brought new insights and dimensions to these programs.

One must certainly conclude, therefore, on the basis of a splendid beginning and its unique attributes, that IIASA has been well worth the substantial investment of time, effort, money, and commitment that has been entailed. Yet much remains to be done if IIASA is to realize its great potential for good.

IIASA AND THE POLICY MAKER

When Professor Gvishiani addressed the IIASA Conference last year he specifically warned the Institute against overlooking "the practical applicability of its findings in real life", and emphasized the goal of making the end product of research understandable to the public and to decision makers. (2)

It is this objective of IIASA that concerns me the most.

There seems to me a real danger that IIASA may not be doing a good enough job of gaining understanding of its work by either policy-makers or the public. In fact, by its emphasis upon the arcane science--if it is a science--of systems analysis, it may be further isolating the scientist from those who direct the affairs of men. This is a peril that exists not only in IIASA, but in the scientific/policy interface in each of the participating countries, as scientific and technological concepts become more complex and as agreement upon scientific data and findings becomes increasingly difficult to achieve, even within the scientific community.

While each National Member Organization and other national scientific organizations must bear the brunt of the work of improving the lines of communication between science and those making policy, IIASA nevertheless has a measure of responsibility. This fact was recognized not only by Professor Gvishiani, but by Director Levien when he called upon Conference attendees last year to ask themselves:

> "Who should know about IIASA's work and how can they be reached?" (3)

Howard Raiffa, too, recognized the problem when three out of the four questions he directed to the Conference dealt with the communication problem.(4)

This difficulty of communication is related also to the kinds of projects that IIASA undertakes. The word "applied" as it appears in IIASA's name probably means different things to different people, but to me it implies a considerable concern for real life problems. And communications must be open if those problems are going to find their way from the policy-

maker (where they arise) to the scientist.

While IIASA has paid increasing attention to the need for addressing real policy issues and to the task of developing better lines of communication with policy-makers, it still has a considerable distance to travel in that direction. The subject is so critical that it might be well to think of making it another area of research within the Institute: consideration of the linked questions of how science can better relate to policy concerns and how there can be more effective interaction between scientist and policy maker.

As part of such a research project, a series of activities might be undertaken, or expanded, to expose decision-makers and their aides to the work of IIASA and to seek their input into proposed and ongoing Institute research programs. Such activities might include:

- Expansion of the guest scholar program to include a series of one week indoctrination conferences for principal policy-advisers, based on case studies to which systems and decision analysis would be applied.
- Use of the Delphi method, or related processes, to better determine what, in the opinion of policy-makers, are the real needs for systems analysis research in the years ahead. This would assist IIASA in developing a more client-oriented research program.[5]
- Encouragement of national programs of agency review by systems analysts, who would spend between one and two years with agencies, becoming familiar with their analysis technique, would spend several months with IIASA and

other international organizations, and would suggest modifications in agency procedures based on what they have observed and learned.

- Development of tiered forms of visual presentation, similar to those used in the Budworm study, which can be presented not only to lay audiences, but also (with the addition of more complex audio-visual material) to groups possessing higher levels of sophistication or technical knowledge. (6)

Films, film strips and slides are excellent as a medium of presentation if imaginatively put together. But charts can be deadly, unless kept very simple. More valuable than any such techniques, however, is the opportunity to meet personally with IIASA project leaders and to become familar in some depth with at least one ongoing research effort.

Use should be made of NMOs, too. They might sponsor seminars and other activities to familarize national leaders, public interest groups and industrialists with the IIASA program and what it offers for them.

A POLICY ORIENTED AGENDA FOR THE EIGHTIES

As one looks at the full range and magnitude of global and universal problems which will confront mankind in the balance of this century, the task of making recommendations for substantive improvements in IIASA's work seems a formidable one. Actually, the program concept already adopted by the Institute appears to be a logical one, thoughtfully constructed, addressing as it does critical world problems possessing either global or universal aspects. Again, there appears to be value to the

matrix approach used in correlating the work of the four research areas as they address these problems.(7)

Obviously IIASA cannot deal with all of the world's problems--nor should it attempt to do so. What it can and should undertake is the simplification of the most critical and complex problems through the process of systems analysis, at the same time lending its valuable international perspective to the process of problem solving.

Several critically important problem areas need to be addressed, if IIASA's work is going to be of real value to decision-makers and be influential with them. These areas include:

1) The analysis of strategic problems of resource shortage and allocation, climatic effects, and the oceans.
2) Economic analysis, as applied to environment, energy, resources and growth.
3) Analysis of global and universal problems of pollution.
4) Additional, and perhaps more usable, work in the field of conflict resolution.

SPECIFIC SUGGESTIONS FOR IIASA RESEARCH

A. STRATEGIC PROBLEMS

Turning first to the groups of strategic problems, four major areas of study would be particularly valuable to the decision-maker over the next ten years:

1) Atmosphere and Climate. Study and modeling of world atmospheric and climatic trends, with the goal of reconciling the conflict between cooling trend and warming trend theories. The questions of CO_2 loading and

changes in the heat balance should be examined in detail, as should the question of ozone depletion.

2) Resource Shortages. Analysis of resource shortage problems, including energy, food, water and minerals, including modeling of alternative scenarios.

3) Risk Assessment. Development of more refined techniques for assessing the risks in new technology, with special emphasis upon possible long term irreversible alterations in ecosystems and in socio-economic institutions.

4) The Ocean. Application of systems analysis to problems of the ocean, with particular emphasis on conflict resolution and Law of the Sea issues. Here is an opportunity to apply systems and decision analysis prospectively as the treaty institutions develop, and to monitor and analyze effects of development of ocean resources.

Fortunately IIASA is already involved in much of this work, with its studies in energy, food and climate, and with its efforts in the area of impact assessment. Nevertheless the importance of these issues to policy-makers deserves emphasis. One area, however, in which IIASA has not thus far played an important role is the ocean, and yet that area offers a unique opportunity to apply IIASA expertise in a conflict-laden situation where all nations have an important stake in finding solutions. Application of the process of adaptive impact assessment to the preparation of environmental regulations governing seabed mining operations would be one valuable contribution. Another might be to model the risk potential involved

in super tanker operations in different accident scenarios. A third could involve preparation of forecasts as to the results of various fish management regimes and management formulae, such as maximum sustained yield and optimum yield.

B. ECONOMICS

In the area of economics, several programs would be of real value to policy makers. They include:

1) Development of better tools for measuring the relationship between economic growth, inflation and environmental regulations in developed and developing world situations.
2) Modelling of the relationship between economic growth, quality of life, and energy, water and other resource use.
3) Development of refined models which recognize the failure of current economic theory to discount correctly the value of non-renewable resources, such as prime agricultural land.
4) Development of models to interrelate more satisfactorily the costs of pollution and the costs and benefits of pollution control efforts.

C. POLLUTION

While much national research has already been done in the area of pollution, the tools used for setting standards and for achieving goals are still inadequate. IIASA could make a valuable contribution here by engaging in research in the Resources and Environment Area along the following lines:

1) Perfection of more sophisticated monitoring techniques and models to measure and predict environmental effects.

2) Additional research into the health and ecological effects of energy production, transportation and use, particularly as to newly emerging technologies.
3) Analysis and modeling of health and ecological effects of chronic exposure to low levels of pollutants and toxic chemicals in the environment.
4) Modeling of the effects in 1985 and 1990 of various levels of air and water quality standards presently enacted and planned. Such information would be extremely valuable in setting and revising standards.
5) Development of better models to forecast the role of non-point source pollutants in stream pollution.

D. CONFLICT RESOLUTION

IIASA has done much interesting work in the area of decision analysis, but there needs to be a greater emphasis on client related research problems. The emphasis should also shift somewhat from guidance for the actual policy-maker to dealing with multi-party conflict situations. The following projects would be valuable:

1) Studies in data mediation and the use of systems and decision analysis in resolving environmental and community conflicts which involve diverse interest groups.
2) Conduct of a case study, headed by lawyers and political scientists (but drawing on the expertise of systems and decision analysts), which would undertake resolution of an actual regional or international environmental or resource-related conflict.

CONCLUSION

For a layman to review scientific research and systems analysis for either procedural or substantive gaps is presumptious, at the least. Yet even a layman, exposed for a period of time to IIASA programs, comes away with the feeling that IIASA is now fully functional and in good health. In general its programs are valuable ones, addressed to the most important global and universal needs. The accomplishment involved in putting a large research organization together, with its component multi-national parts, in the short period of four years is considerable. That it was done at all is remarkable. That it was done with style and effectiveness is a great tribute to those who gave it birth and nursed it through this formative period.

Now IIASA is entering a new phase. It has reached the point of rapid rise in its sigmoid life curve. Whether it can meet the tests in this period of its life will depend increasingly on its ability to deal with problem-oriented research and to relate closely to policy-makers.

There are signs that it is meeting these tests. But there is also some evidence to the contrary. This paper is just a first step in the direction of recommending more policy-oriented research. The experience that led to the above recommendations has been a valuable one for the writer and the exposure of other policy makers and advisers to similar experiences could do a good deal more to bridge the gaps referred to in this paper. Let us hope they will have that opportunity.

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