

Rapporteur's Summary

H. Chan

Rapporteur's Report on Session III: how adequately do IAMs reflect the existing socio-economic structure in developing countries?

Rapporteur: Dr. Chan Huan-Chiang

Universiti Sains Malaysia (University Science, Malaysia)

The two speakers addressed the issue of how successful IAMs have been in taking into account the social and economic dimensions prevalent among developing countries from opposite directions. Prof. Shukla made a critique of several shortcomings which have caused many IAMs to be inadequate in dealing with issues critical to developing countries. Dr. Zhou, on the other hand, took a more optimistic view by reporting on the many breakthroughs that have been achieved through collaborative efforts between Chinese scientists and their overseas counterparts in applying IAMs for China. However, in retrospect, and after considering the many constraints, such as data limitations, Dr. Zhou felt that his report may instead be indicative of "making no progress in modeling in China."

The more critical difference is that, on one side, we have a number of attempts to extend existing IAMs to handle Third World problems and processes and on the other, an IAM which is entirely built within the developing world but using a model framework which originates in the developed world. Regardless, in the conclusions drawn, both authors have consensus in that much is still needed to further develop and refine IAMs for their Third World relevance.

These conclusions are well reflected in the comments made by both discussants. Dr. Ruffing cited some of the progress made in pursuing the sustainable development agenda at the United Nations, while Dr. Nakicenovic related experiences of modeling efforts at IIASA. The following are remarks common to both discussants.

First, the IAM is a class of model which has a long to very-long time frame, i.e. in the magnitude of fifty to a hundred years. In building these models, our knowledge of the past becomes less and less relevant as a basis for forecasting the future. Furthermore, socio-economic models do not normally extend to this long a period, making it difficult to fit them in. We thus have to deal with the dynamics of IAMs better.

Second, IAMs have to deal with various forms of structural shifts we expect to occur not only within developing countries but also between countries in the South and the North. For example, transitions of varying degrees from informal to formal sectors of the economy will have to be incorporated. This will have implications on improvements in technology, which also impact on the energy and natural resource inputs to production. Whether data will more readily emerge from this transition remains a question. Then there is the issue of how countries from both the North and South will integrate by the transfer of various types of various types of production between them.

Third, IAMs will have to improve on their ability to capture key driving forces and relationships better, such as the social, economic and political forces at play in the various developing countries. This is where more meaningful sensitivity analysis may be incorporated. For example, a developing economy may adopt the typical investment led growth, the extent of which can be achieved is dependent on capital-output ratios. Or, the same economy may adopt alternative development strategies which is not gauged on the basis of GDP numbers alone.

When discussions were open to the floor, the following interventions were made:

Mr. Sazedur Rahman (Bangladesh Meteorological Department, Bangladesh)

With regards to Professor Shukla's presentation, the loss of life during the 1991 cyclone was reported as 200,000. The correct figure is 138,000. Secondly, I differ greatly with the speaker's comment about the value of life in Bangladesh. The speaker mentioned that the cost of a human life in Bangladesh was less than \$1000; on the other hand, the speaker pleaded that the life could be saved by investing \$1000. These comments are highly motivated and incorrect. Twenty million people live in the coastal region of Bangladesh. The entire coast is vulnerable to cyclones. Every year or every alternate year, Bangladesh is battered by tropical cyclones. Of the total number of tropical cyclones in the globe, about 5.1 percent are developed in the Bay of Bengal, and most of these strike Bangladesh's coast with various intensities. It is not possible to evacuate the entire population from the coast during cyclone periods. During the 1991 cyclone, everything was done to mitigate the loss of life, but high gales, high surges and furious seas caused the colossal loss of life. Mankind has its limitations against nature, and this just cannot be overcome by investing dollars.

Dr. Rosa T. Perez (Philippines)

"I am grateful to Prof. Shukla for pointing out that broader notions of development than can be captured by the neo-classical paradigm of preference maximisation are subscribed to by policy makers. In fact, multilateral development organisations, such as the A.D.B. have adopted strategic development objectives, including social and environmental concerns, in addition to the earlier objective of economic growth. Prof. Shukla has pointed out that the INC negotiations have embodied these broader development concerns in the UNFCCC. In fact, I would suggest that they are smarter still, and have recognised not only broader development concerns, but that these may differ across countries and over time.

The point I am trying to make is this: Model builders need to recognise that perceptions of development evolve over time through countries' internal political processes and debates. Accordingly, they should not try and second guess the policy makers' perceptions of development. The implication for our work here is that we should eschew the focus on policy optimisation models. Instead, we should focus on simulation models which would help policy makers assess the impacts of multilateral and national level policy proposals. The actual valuation of these impacts should, however, be left to policy makers."

Prof. Emelio Lebre La Rouvere (Brazil)

"My question goes to Prof. Shukla and Dr. Nakicenovic. It is about the social dimension of the climate change issue. How to integrate it in IAMs? This point was already raised by Prof. Bolin this morning. Social problems are crucial issues in developing countries, But they are becoming increasingly important in OECD countries too. The concept of dual societies initially designed to describe developing countries is now applicable to OECD countries as well. However, IAMs pay much more attention to macro economic issues. So far, little effort has gone to disaggregate the different classes in OECD countries. For example, it would be interesting to differentiate the impacts of mitigation measures on the rich and the poor. Aspects of income distribution and social behaviours should be included in the IAM description of OECD countries. This will provide useful insights on the methodological options to deal with developing countries as well.

Another example related to the inclusion of the informal economy in IAMs. This is an important problem not only in developing countries but also in transitional economies, and even in some OECD countries (e.g. Italy). Tackling this issue in the IAM description of OECD countries could be a useful first step towards its future inclusion in the representation of developing countries. I am looking forward to the comments of the panelists on this point:

In order to adequately reflect the existing socio-economic structure in developing countries, IAMs should first ensure an appropriate description of the social structure in OECD countries.”

Response by panelists:

Prof. Shukla agreed with the points made by Mr. Sazedur. The Bangladesh case cited were merely examples. Workings of nature and catastrophes are not easy to be incorporated into any model framework. In citing such examples, the point made is that IAMs, as they are, do not properly treat the circumstance in which markets fail and how the affected public good is subsequently delivered.

Prof. Shukla also agreed with Dr. Ghosh. The response is perhaps, IAMs should have started from the policy question end. In fact, policy questions and the results that model gives, iterate back and forth one feeding into the other over several cycles before issues could be better understood.

In responding to Prof. Amelio Rovere, Prof. Shukla wonders how the may diversified issues ranging from regional differences and population segmentations could eventually be fully addressed by the IAMs. This perhaps is the challenge that lie ahead.

Dr. Nakicenovic concurs with points made by Prof. Amelio Rovere. The different model makers from different backgrounds need to improve their understanding of each other's work, such that heterogeneity is injected into IAMs. Specifying a whole series of distribution functions to incorporate the many diversities of regions and populations might be a potential first step.

The use of simulation models in a policy making environment, according to Dr. Ruffing, will be a potential area of investigation, especially when different regions have to be taken into account. Yes, we need to iterate between policy aspects and IAM results.