Why do we need a Society for Integrated Assessment?
By Claudia Pahl-Wostl, President, TIAS (November 2004)

In a nutshell, Integrated Assessment (IA) may be defined as the interdisciplinary process of integrating knowledge from various disciplines and stakeholder groups in order to evaluate a problem situation from different perspectives and provide support for its solution:

- IA should support policy and decision processes
- IA should help to identify desirable and possible options

Hence IA builds on two major methodological pillars:

- Approaches to integrating knowledge about a problem domain
- Understanding of policy and decision making processes.

Whereas initial work in IA focused mainly on models as tools for integration and portrayed policy processes as optimization by an individual decision maker, the above definition reflects already advanced practices of IA. The integrating aspect of IA refers to scientific and stakeholder knowledge drawn from multiple disciplines backgrounds, and the use of a wide range of methods. Policy processes are perceived as polycentric, multi-scale processes where learning and evolutionary change play a major role. Assessment is not just a passive process where information is developed for some elusive decision or policy maker. Integrated Assessment actively shapes the science-policy interface, an area which has always been in a grey zone of responsibility between the scientific and policy communities.

Being located at the boundaries is intriguing but also gives rise to dangers. IA faces the challenge of earning credibility in both the scientific and the policy communities and is at risk of not being respected by either. Hence, a forum for the exchange of experience is urgently needed. Integrated Assessment has become very popular among scholars and policy makers over the past years. IA is developed and applied over many different research and policy fields such as climate change, sustainable agriculture, land use, water management, and biodiversity, in different cultural and institutional contexts and methodological approaches are therefore diverse. This is a very positive and exciting development. However, as a result of its application to so many fields, articles on IA are published in an array of different journals and therefore scientific exchange does not always take place. One example is the recent involvement of the water community in integrated water management and stakeholder participation. This implies the need for a new approach to dealing with uncertainty and a new perspective on policy processes. Initially, there was little awareness of the rich experience of the Integrated Assessment community in this field. However, a fruitful exchange has, more recently, been initiated with this community. IA will always rely on disciplinary expertise and should provide feedback to disciplinary research in order to tackle questions of policy relevance in a larger context. At the same time IA has developed its own research agenda in areas where new system-oriented concepts that cross disciplinary boundaries are needed.

The practice of IA has attracted a wide range of practitioners who are interested in applying their knowledge to a problem domain, for example, the fish biologist working on toxicological effects as part of a study on participatory risk assessment of new chemicals, or the psychologist examining the role of emotions in a study of environmental conflict management. At the same time, we might have system scientists developing new concepts for the participatory assessment and implementation of adaptive water management regimes, new modelling approaches or concepts for transition management. All of these people will also be rooted in their disciplinary and/or problem-oriented communities. In this respect, IA may be perceived as a kind of "meta discipline".

An improved understanding is required for the policy processes into which an IA is embedded. Polycentric governance and social learning have gained increasing importance in characterizing complex multi scale, multi-actor processes and evolutionary change in society. However, the

theoretical concepts behind them are as yet fragmented. To improve our state of knowledge, we require a critical analysis and synthesis of the diverse approaches and innovative inter-disciplinary research within the social sciences.

Another area requiring treatment is the concept of "uncertainty". Numerous methods and formal techniques exist, in particular in the natural sciences and engineering, to characterize uncertainty in data and to quantify the influence of parameter and model uncertainties on the outcome of simulation models.

Such approaches to dealing with uncertainty in knowledge and the inherent limitations of the predictability of complex systems need to be combined with uncertainties that arise from subjective perspectives and socially constructed realities? Ambiguities may arise in the communication between actors when they attribute different meanings to "factual knowledge" and subsequently frame a problem situation quite differently. Although much progress has been made, more work is required to further develop and implement approaches to cope with different kinds of uncertainty fruitfully within IA practice.

The development of integrated models has made considerable progress over the past few years due to major breakthroughs in computational power. A very fruitful exchange has been initiated between the IA modelling and the agent-based social simulation community. Agent-based models allow a more realistic representation of human behaviour. For the first time, it is possible to develop dynamic simulation models of human-technology- environment systems under the same modeling paradigm. The direct representation of human-environment interactions is of particular interest for spatially explicit models.

Here we also see new challenges arise from both a conceptual and a technical perspective. How can we validate these integrated models? What is the appropriate level of complexity in these models? Despite technical advances, the use of integrated models and decision support systems in policy and decision making processes cannot be judged as satisfactory - there remains a science-policy gap. The emerging and fast growing research field of participatory modelling and group model building is one response to the need to bridge this gap.

Originally developed for scenario analysis in business management, these techniques are increasingly applied to environmental problem solving and resources management. The model building becomes part of a process of social learning within an actors group. The actors acquire ownership of models and of the process as a whole, thus increasing the likelihood that the results will be translated into real policies. Many interesting research questions remain to be addressed in this fascinating field - questions that require interdisciplinary research among the fields of sociology, social and cognitive psychology, decision sciences, artificial intelligence, and computer science in order to strengthen the conceptual foundation.

Participatory approaches in general have found widespread application in IA. Participation may enrich an assessment by including stakeholder perspectives. At the same time the participatory process is already part of the implementation of the policy. In polycentric governance, where stakeholders and the public are involved in policy development and implementation, active involvement can range from simply having discussions with the authorities and experts, to actively contributing to policy development (co-designing), influencing decisions (co-decision-making), or even full responsibility for (parts of) policy implementation. We need improved concepts for participatory governance that integrate knowledge and experience among diverse fields.

TIAS has initiated activities in several areas of significant interest to the IA community including:
- establishment of a compendium of training materials to be used in the teaching of IA and share them in the IA community;
- models with accompanying guides on the web;
- a listing of education programmes, summer schools and other training activities;

- dissemination of information to the network of IA practitioners who are active in various communities;
- organization of education and training activities; and
- organization of sessions at conferences and workshops.

A scientific community comes into being through its activities, and members of the IA community are contributing to these activities though the formation of a Society.