Challenges for IIASA's interdisciplinary research

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Outline

- IIASA: a brief overview
- Why aiming for interdisciplinarity?
- “Data” collection: Modeling, evaluation and research council experience
- Stumbling blocks
- Success factors
- Conclusions

History

- 1967 initiative of US President Johnson and Prime Minister Kosygin, Soviet Union
- Create research center as a "neutral bridge between east and west"
- Original Charter signed in 1972 by 12 countries
- 1994 Ministerial Conference: renewed mandate as independent, scientific institution
- In addition to East–West also North–South, meaning Global

Mission

The Institute's strategic goal is to conduct international and interdisciplinary scientific studies to provide timely and relevant information and options, addressing critical issues of global environmental, economic and social change, for the benefit of the public, the scientific community, and national and international institutions.

From: IIASA Enters the Twenty-first Century, 2000

Current 18 Members

- Austria
- China
- Czech Republic
- Egypt
- Estonia
- Finland
- Germany
- Hungary
- INDIA (NEW)
- Japan
- Netherlands
- Norway
- PAKISTAN (NEW)
- Poland
- Russian Federation
- Sweden
- Ukraine
- United States of America

Research themes and programs 2006 - 2010

ENERGY and TECHONOLOGY

Dynamic Systems
Energy
Transitions to New Technologies

ENVIRONMENT and NATURAL RESOURCES

Atmospheric Pollution and Economic Development Land-Use Change and Agriculture
Evolution and Ecology
Forestry

Research themes and programs 2006 - 2010

POPULATION and SOCIETY

Population and Climate Change
World Population
Processes of International Negotiation
Risk and Vulnerability

SPECIAL PROJECTS

Health and Global Change
Integrated Modeling Environment
Greenhouse Gas Initiative

Young Scientists Summer Program (YSSP)

- Advanced students
- June – August
- Work with IIASA programs
- Funded by NMO & other sources
- Publication
- Peccei and Mikhalevich awards

Our policy relevant research results

- Biology: Changing traits of fish
- Air pollution: Cheap abatement options when combined with climate change
- Agriculture: Effects of climate change
- Population: Decline in Europe
- Technology: Web is dominated by the West
- Forests: The missing sink
- Disaster management: Cost sharing
- Climate change: New scenarios

Scientific Personnel

	2003	2004	2005	2006
Head count	120	153	184	184
Person years	65	73	85	91
Average stay (mth)	6.5	5.7	5.5	5.9

Collaboration at IIASA

- Programs organized by topic, not by discipline
- 40% social science, 41% natural science, 19% mathematicians
- Many collaborations via joint modeling projects
- Greenhouse Gas Initiative: crosscutting through IIASA

Why aiming for interdisciplinarity?

The world has problems, the university has departments

- Challenge: how to translate ‘real world’ problems into scientifically accessible (as well as scientifically attractive) problems.
- Moreover, the tractability of problems differs from field to field

The whole is more than the sum of its parts

- Challenge: how to arrive at a timely synthesis of different specialized bodies of knowledge

Knowledge, skills, methods and instrumentation often cut across disciplinary boundaries – therefore, much is to be gained by their complementarity

- Challenge: to know in advance which kind of knowledge, skills, methods and instrumentation is needed and useful to be transferred from one field to another.
- Each transfer has its costs that must be outweighed by the benefits

Serendipity and new discoveries often occur at the borders of established research fields and/or disciplines. Therefore, openness towards interdisciplinarity will lead to their increase

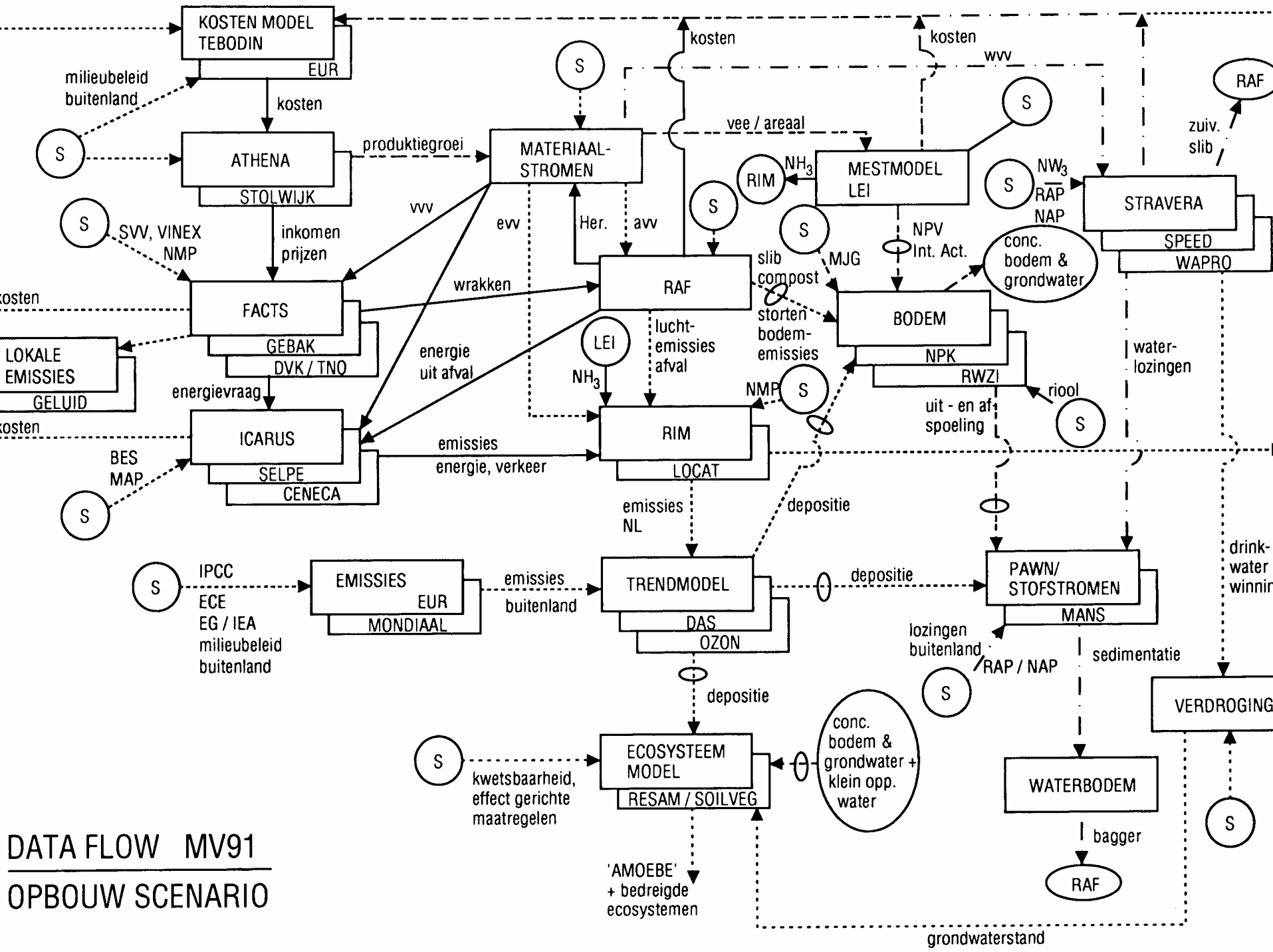
- Challenge: yes, but only if we know in advance where it will happen...

Industrial research exemplifies that it is possible to work in an interdisciplinary way with good results

- Challenge: industry is mainly engaged in development (applying already available knowledge).
- How much industrial organization can be implanted into a university?

“Data” collection: Modeling, evaluation and research council experience

- **RIM**: Economy-Environment Assessment Model; Amsterdam, 1980-1984
- **RAINS**: Regional Acidification Information and Simulation model IIASA, 1984-1987
- **MNP**: Netherlands Environmental Assessment Agency, RIVM, 1989-1991
- **COOL**: Climate Options for the Long Term, Seven Dutch Institutes, 1996-1999
- **GEA**: Global Environmental Assessment project, Harvard University,1998
- **NWO**: Chair of Social Science Council, The Hague, 1995-2001
- **NOP**: Chair of National Research Program Climate Change and Global Air Pollution, Netherlands, 1992-2001
- **GGI**: Greenhouse Gas Initiative, IIASA, 2003-
- **Evaluations** of National Research Programs, including US NAPAP; Finland’s HAPRO, SILMU and FIGARE; IHDP; IMAGE model



DATA FLOW MV91

OPBOUW SCENARIO

Stumbling blocks

Failed collaborations are likely to have:

- Questions formulated by one side (climate change, NOP; LOICZ, NWO)
- No shared concepts (sustainability; RAINS-Asia)
- Problems with semantics (policy relevance; GEA, SILMU)
- Lack of commitment (social science in NOP)
- Misconception of roles and place (soft science; NOP, HAPRO, NAPAP)
- Difficulty in attracting good scientists (publish or perish; all)
- Poor communication and physical separation (RIM -> MNP)

Success factors

Successful collaborations are likely to have:

- Shared concepts and language
- Excellency in own field
- Joint proposal development
- Sub-projects to allow individuals to succeed in their own field
- Intellectual respectability
- Long term commitment
- Good communication and personal contact

Success is more likely …

- In newly emerging research fields
- When institutional boundaries are blurred
- In new and flexible institutions
- When people, ideas, instruments are mobile
- With good leadership: individuals matter (openness, reciprocating)

Can interdisciplinary research be organized?

- Organize separate review of proposals
- Avoid interdisciplinary PhD projects
- Long term collaboration with training options and career opportunities
- Cross-cutting methods/methodologies, e.g. game theory in economics, political science and evolutionary biology
- Create peer reviewed publication outlets

Be patient: it takes time for interdisciplinarity to mature.

It is also risky.

Develop confidence into your own judgment.

Thank you