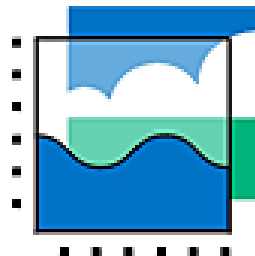


Integrated Assessment vs Industrial Ecology models

René Kleijn



Universiteit Leiden
The Netherlands



CML
Department of Industrial Ecology

Leiden University. The university to discover.

Introduction

- the world is a complex system
 - complexity in system Earth
 - complexity in material flows in society
 - (complexity in social interactions)
- how can we assess the impacts of proposed technologies, policy measures etc. ?



Abstractions from the real world: models

- General Circulation Models
- System Dynamics models
- Material and Substance Flow Analysis
- Environmentally extended input-output analysis
- Life Cycle Assessment

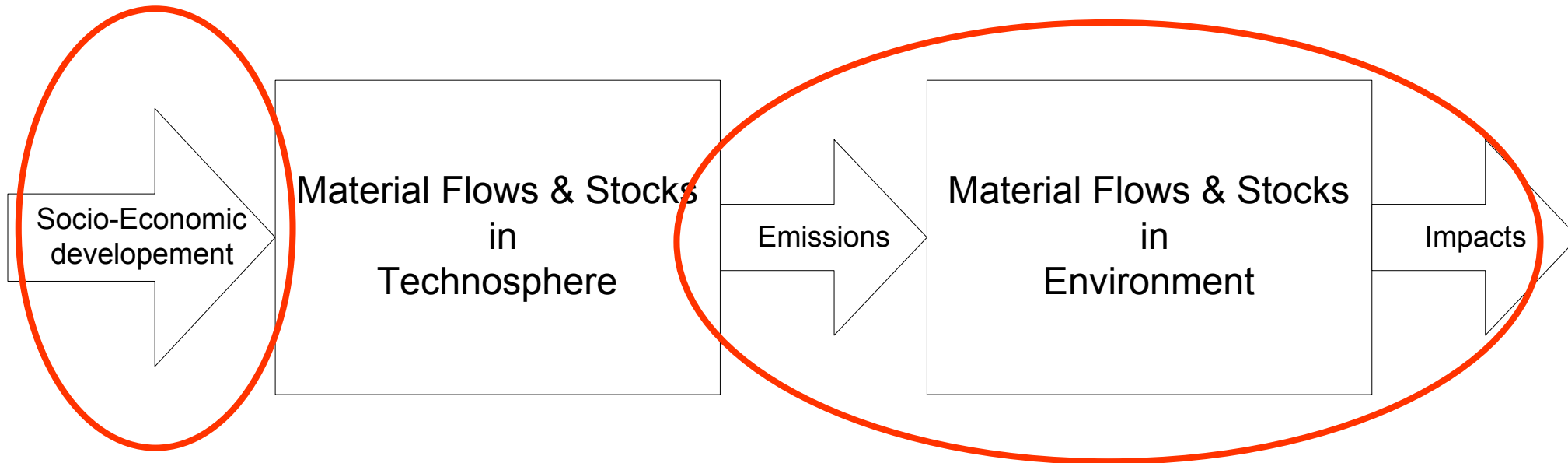


Integrated Assessment

- Models related to specific problems:
 - IMAGE: climate change
 - RAINS: acidification
- Systems perspective: from drivers to effects
- highest resolution in the modelling of environmental effects
- low resolution in the drivers module



Focus of Integrated Assessment models

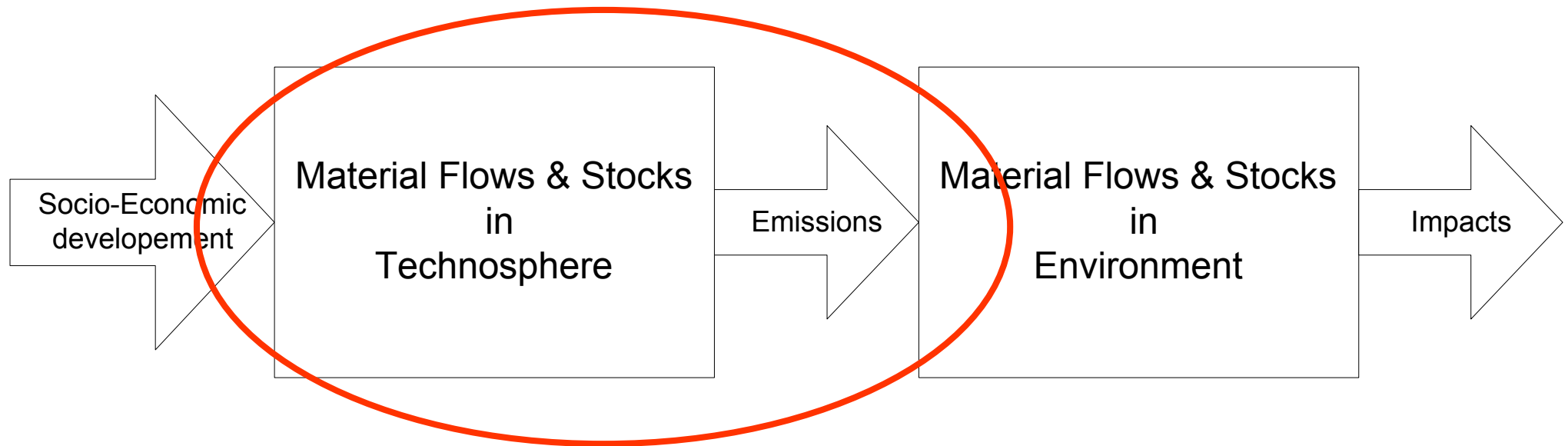


Industrial Ecology

- Models related to different material flows
 - LCA: related to product/service systems
 - SFA: related to specific (groups of) substances
 - MFA: related geographical regions
- systematic views: from drivers to effects
- highest resolution in the modelling material flows in society
- low resolution in the modelling of environmental flows



Focus of Industrial Ecology models



Integrated Assessment vs Industrial Ecology

- Integrated Assessment models are widely used to support policy on important topics: e.g. climate change and acidification
- Industrial Ecology models are widely used to assess the impacts the consumption and production of products and materials
- In both cases important side-effects (co-damages and co-benefits) are overlooked by the limited scope of models



Conclusion & recommendations

- Models are by definition limited abstractions of the real world
- By combined use of Integrated Assessment and Industrial Ecology models, a broader set of side-effects can be covered
- However an even broader system perspective is necessary to check for side-effects
- Therefore every analysis should start from a broad systems perspective



Reference

Kleijn, R., E. van der Voet, H.A Udo de Haes (2008) The need for combining IEA and IE tools: The potential effects of a global ban on PVC on climate change. *Ecological Economics*, 65, 266-281.

