UNIVERSITÄT HOHENHEIM

Scientific Tools for Systems Approach, Multidisciplinarity and Transdisciplinarity

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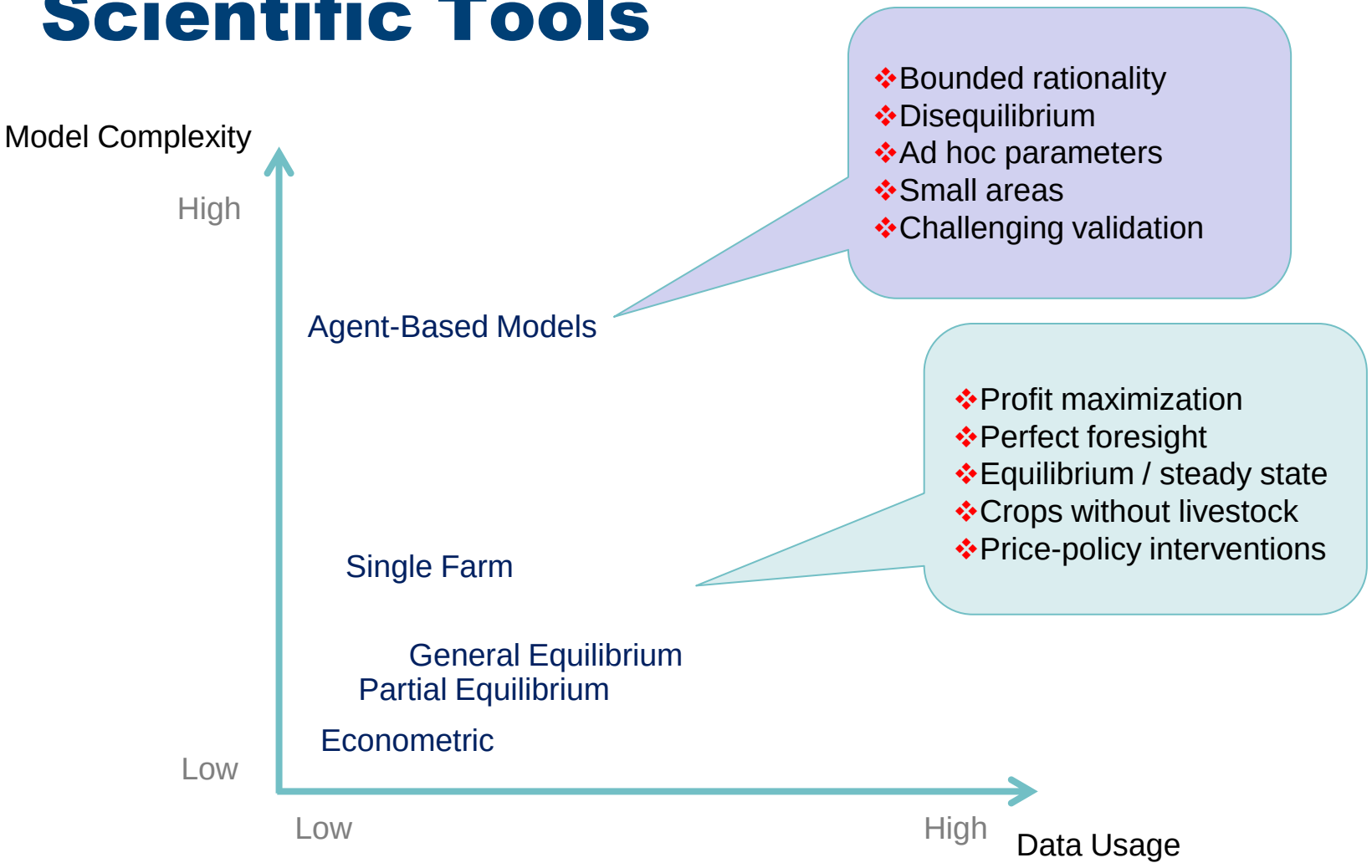
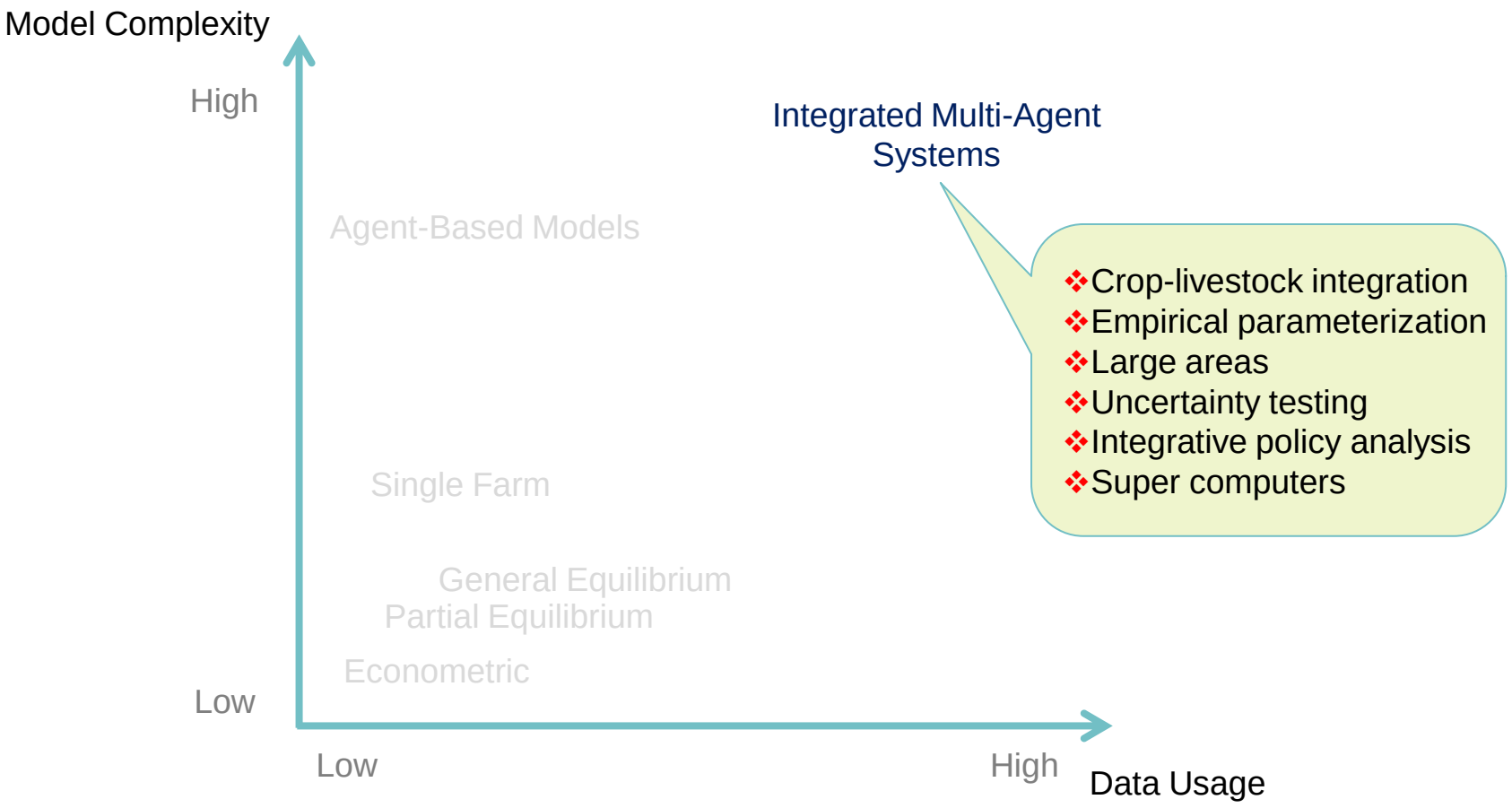
Excerpts from HLPE Report

- **Livestock**
  - → Central to food systems development
  - → Particular dynamic and complex
  - → Largest user of land resources
  - → Crucial economic role
- **More data and monitoring**
  - → Identify challenges and available solutions
  - → Define responses and technical solutions
  - → Dynamic and iterative process of learning-and-doing

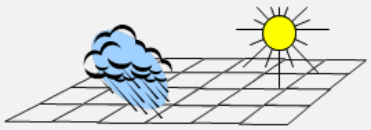
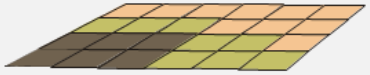
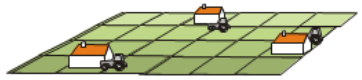
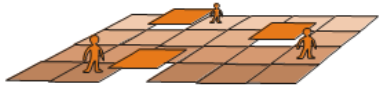
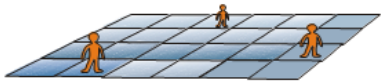
Scientific Tools



Data-Intensive Computing

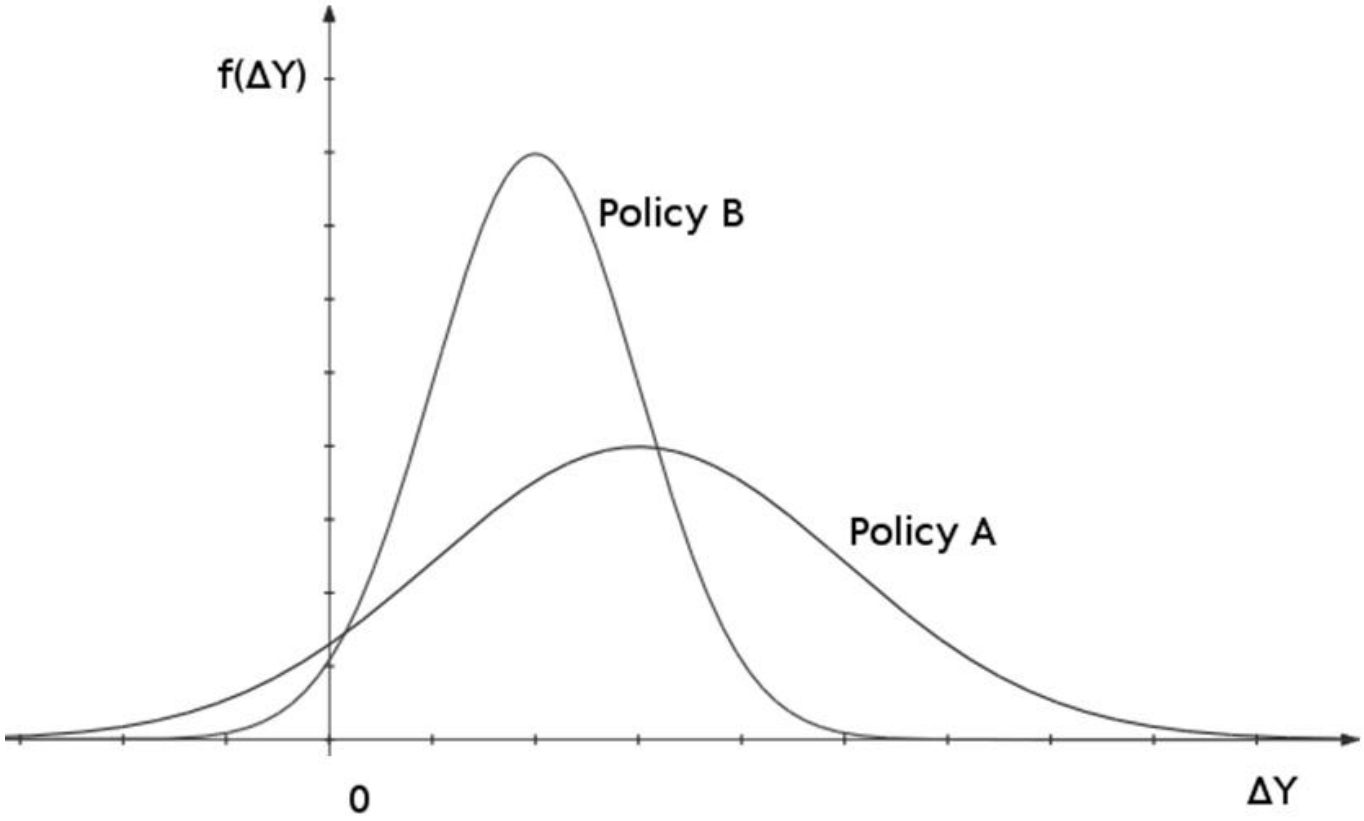


Integrated Multi-Agent Systems

Layers		Modules
		[built-in or external software]
Weather		Meteorology
Water run-off		Hydrology
Soil quality		Soil nutrients/erosion
Land use		Crop growth Agent decisions
Factor endowment		Carry-over of assets
Property rights		Land markets
Networks		Communication Collective decisions

Berger & Troost 2014. *Journal of Agricultural Economics*

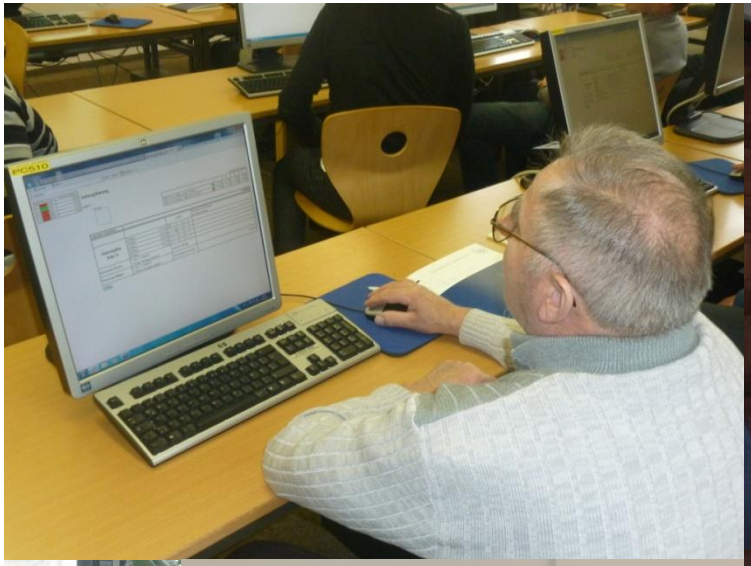
Policy Analysis under Uncertainty

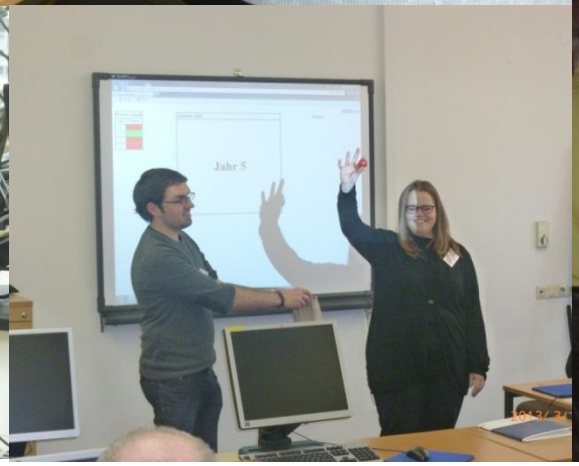


Troost & Berger 2015. *American Journal of Agricultural Economics*

Interactive Modeling

DFG Research Unit ‘Regional Climate Change’
Germany 2013





CGIAR Challenge Program Water & Food
Chile 2007

Science and Research for Action